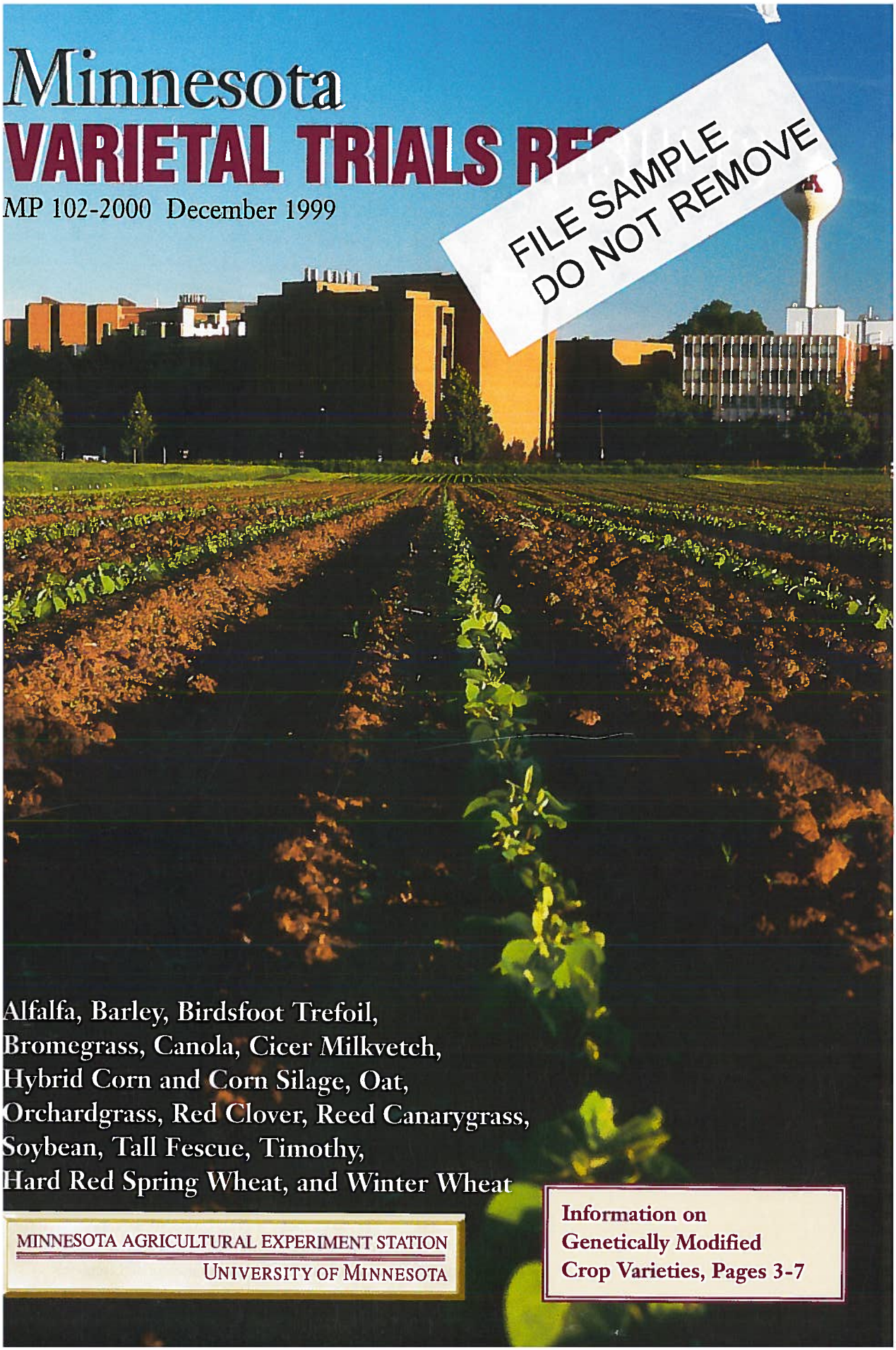
Minnesota
VARIETAL TRIALS RE

MP 102-2000 December 1999



Alfalfa, Barley, Birdsfoot Trefoil,
Bromegrass, Canola, Cicer Milkvetch,
Hybrid Corn and Corn Silage, Oat,
Orchardgrass, Red Clover, Reed Canarygrass,
Soybean, Tall Fescue, Timothy,
Hard Red Spring Wheat, and Winter Wheat

MINNESOTA AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF MINNESOTA

Information on Genetically Modified Crop Varieties, Pages 3-7

CONTENTS

The information in this miscellaneous publication of the Minnesota Agricultural Experiment Station is presented under authority granted by the Hatch Act of 1887, to conduct performance trials on farm crops and interpret data to the public. Data in this publication are preliminary. Only crops for which new data were compiled in the 1999 growing year are included. A version that incorporates corrections, revisions and additions is maintained in electronic form on the world wide web site of the Minnesota Agricultural Experiment Station, http://www.maes.umn.edu. Electronic versions of some past years reports on these and other crops can also be found at that world wide web site.

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By Charles C. Muscoplat
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Can We Imagine Plant Varieties Five to Ten Years From Now?

We have all been reading about the controversy surrounding genetically modified organisms (GMOs). Hardly a day goes by without reading about another country banning GMO soybeans or corn. The truth of the matter is that the biotechnology revolution is really just beginning. Biological technologies are moving exceedingly faster than could have been predicted a few years ago. In the year 2000 the human genome will be nearly sequenced – a full 5 years (or more) ahead of the best predictions of several years ago.

The biotechnology industry association reports that 79 human pharmaceuticals derived from biotechnology are now on the market in the United States. In agriculture, there are 37 plant biotechnology-derived products currently on the market with 30 additional products anticipated within the next 6 years. The major revolution to come will be in the treatment and prevention of human diseases such as cancer and heart disease with plants and plant products. Scientists also will build disease resistance into plants – both for the diseases of the plant and for the person or animal who eats the plant!

Combinations of chemicals and chemical-dependent plants are only the beginning. Molecular biologists have already developed potatoes containing enzymes, which can prevent type II diabetes in laboratory animals. Scientists in Argentina have produced transgenic alfalfa, which produces proteins from the foot and mouth disease virus and when eaten by animals will induce a protective immune response in that animal. Quite literally, animals and people can "eat themselves immune." Cornell University scientists have produced bananas that produce hepatitis vaccine, which immunizes the animal consuming them. The cost per immunization is projected to be less than $.05 compared too more than $100 for conventional hepatitis vaccines.

China has announced the successful combination of rabbit fur genes and cotton genes to produce a cotton variety, whose lint has the texture and warmth of fur, yet can be grown as ordinary cotton plants. The cotton fibers are longer and stronger than conventional cotton fibers. The chemical industry has announced the engineering of transgenic plants to produce biodegradable plastic. Although bacteria can make some forms of biodegradable plastic, they are more expensive than petroleum-based products. Plants, however, are much more efficient at converting carbon into plastic, which could ultimately make the production economically competitive.

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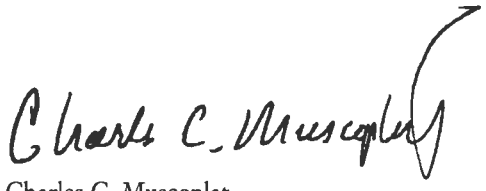
For several years we have had available delayed-ripening fruits and vegetables, which have superior flavor, color and texture, are firmer for shipping and stay fresh longer. Tomatoes now have a shelf life of more than 30 to 40 days from harvest. We already have an array of herbicide-tolerant and pest-tolerant plants, which reduces the amount of chemicals applied to the land and environment. In addition, modern herbicides are easier to apply and safe, thereby yielding double benefits. Within 3 to 5 years we will have colored cotton, reducing the need for dying and dye-shop pollution and improving textile-manufacturing efficiency.

As with many transformative technologies, the benefits cannot always be clearly seen at the beginning. For example, at the beginning of the digital revolution, we had digital watches and calculators but could not clearly envision cellular phones, e-mail, the Internet, our modern desktop computers for $500.00, or global satellite positioning systems. Similarly, at the beginning of the medical revolution we could see antibiotics and vaccines but could not yet envision organ transplants, implantable pacemakers, artificial joints, x-rays, CT scans, or cancer chemotherapy. In agriculture, Gregor Mendel pioneered modern genetics of crops, but we could not envision cultivation-free soybeans, insect-resistant crops, corn yields of more than 170 bushels per acre, fruits that ripen on demand, food that contains pediatric vaccines and numerous others.

It is difficult to know where or when the current controversy will end. The role of the University of Minnesota will be to assure the safety and efficacy of any technology we develop. Additionally, the University has a role in the public debate of public policies and ethics governing the development of any new technology, especially one as controversial as agricultural biotechnology.



Charles C. Muscoplat

Vice President and Dean
College of Agricultural, Food and Environmental Sciences
and Director, Minnesota Agricultural Experiment Station

Developed by University of Minnesota, College of Agricultural, Food, and Environmental Sciences Committee on GM Issues:

Beverly Durgan, Dale Hicks, Terrance Hurley, Seth Naeve, William Schafer, David Schwartz, and Bill Wilke (with special thanks to J. Michael Bennett).

For further information please contact Seth Naeve, Extension Soybean Agronomist at (612) 625-8700.

A consideration of conventional and genetically modified varieties

As the world economy becomes increasingly intertwined, farmers are required to look further and further beyond the farm gate in making management plans each year. Although variety choice seems to be a decision that might be immune to outside influences, recent events have shown that we are very dependent on choices made by others (even those who live very far from our farms).

In response to consumers' desires in Europe and Asia, a market may be developing in the United States for conventional, or non-genetically-modified grain crops. Genetically modified (GM) crops are those that contain special traits that were originally derived from other species. These traits, in the form of individual genes, have been transferred into the crop through biotechnology. Other names for these biological techniques are "gene splicing" and "genetic transformation", and result in the formation of plants termed GM, GMO and GE. Forty GM varieties of tomato, corn, soybean, canola and many other crops are currently available in the United States.

The decision as to which crop varieties to grow on your farm is one of the most important production decisions that you will make for profitable crop production. This year there is an added dimension to this decision for corn, soybean and canola growers. Uncertainties at all levels of the GM issue have caused producers to question whether to purchase GM varieties for the 2000 growing season. This paper is intended to provide some background about this issue, and help farmers make informed variety-choice decisions by describing current consumer and market conditions. Information about processes involved with segregating grain is included as well. Although GM issues are changing daily, we hope that this discussion can be a useful resource in selecting varieties to make your farm as profitable as possible.

Choosing Varieties

Except for seed cost, production costs are not much affected by variety choice. That is, tillage, machinery, fertilizer and land costs are not affected by variety choice. Deciding to grow a GM variety may affect herbicide and seed costs, however. One needs to evaluate those costs, and the expected yield, to determine the potential profitability of GM versus conventional crops.

For any crop, there can be large differences in yield between the lowest and highest yielding varieties that are of similar maturity. If production costs are not greatly different, choosing the high-yielding varieties will result in higher gross return, and a higher net return, after production costs. But, yield is only one agronomic trait. Growers should focus first on yield, and then other traits that may be specific to each grower's needs, such as chlorosis tolerance or standability. Beyond marketing and market access concerns, genetic modifications should be considered as one of many secondary varietal traits.

Consumer Resistance and Labeling

Consumer resistance to GM products is more widespread in Europe than in the United States. That may be partially because of lack of trust in their governments' ability

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to ensure the safety of foods after the "mad cow" scare in beef, and the dioxin contamination incident. Some opponents point to possible GM food safety issues, such as increased amounts of allergy causing proteins or toxins found naturally in food. However, current food safety policies of the United States and European and other developed countries should prevent these increases from occurring. The acceptance of GM products is thought to be based not just on "science," but, also on factors that include each country's culture, values, history, economic conditions and government response to the issue. Consumer acceptance of potential risks from GM or other new-technology food, is also dependent on whether direct benefits, individual control options and involvement in the approval process are perceived.

It has been suggested that the push for labeling in Europe is about such freedom of choice or individual control. It may also be related to concern for the environment since agricultural production and urban areas are in closer proximity there than they are in the United States and Canada. Next year, European Union countries will likely have stricter labeling requirements of products containing GM corn or soybeans, and possibly additives or flavors from GM sources. Labeling of GM foods is currently not required by the U.S. Food and Drug Administration (FDA) unless a potential allergen has been added, or the food contains other that expected levels of nutrients, toxins, or other components. Recent surveys have found that a majority of U.S. consumers support the current FDA labeling policy.

Active consumer resistance to GM products will likely continue in Europe during the next few years. Increased media coverage and more visible opposition in the United States is anticipated. However, the majority of U.S. consumers have been found to have positive attitudes about biotechnology. Consumer acceptance should increase as products with nutritional or health advantages, cost savings, and other improved-quality traits are available.

GM Markets

Consumer opposition to GM foods impacts U.S. producers through an intensification of the current trend toward increased market segregation, identity preservation (IP), and market premiums. A survey conducted in the fall of 1999 by the Minnesota Grain and Feed Association found that 6 percent of Minnesota grain elevators surveyed were segregating GM corn and 12 percent were segregating GM soybeans. Eight percent were paying premiums for conventional grain. No elevators surveyed reported discounting GM grain. Reliable estimates of market premiums are scarce, but media and trade reports suggest premiums ranging from $0.10 to $0.15 a bushel for corn and $0.05 to $0.35 a bushel for soybean in some markets.

The markets for corn and soybean appear to be evolving into three tiers: a domestic GM market, an export GM market, and a non-GM market. Therefore, the seed a producer chooses to plant will provide an option to participate in one or more of these markets. If producers plant GM seed that is approved by the United States but not by major trading partners they will have the option to sell grain only in the domestic GM market. If producers plant GM seed that is approved by the United States and other countries they will have the option to sell grain in both the domestic and export GM markets. Finally, if producers plant non-GM seed they will have the option to sell grain in all three markets.

The costs of selling grain in each market may also differ due to transportation, segregation, and certification costs. Transportation costs will depend on whether local elevators and processors accept grain for some or all three markets. Some of the increased transportation costs may be avoided by planting non-GM grain, or approved GM grain, since both can be sold to more markets. Producers may also be able to avoid some or all segregation and certification costs, which can include the increased costs of handling and increased liability of certified grain, by planting only one type of seed or by selling all their grain in domestic GM markets.

Since producers must plant non-GM seed to secure an option to sell in all markets, including those that may offer a higher price and/or lower transportation costs, the planting decision may at first seem obvious. However, greater market access does not guarantee higher profits because there is a cost for obtaining an option for that greater market access. This cost is equal to the difference in the expected net returns between non-GM and GM grains. If planting GM seed increases yields, lowers production costs and/or improves grain quality, the cost of securing an option for greater market access can be substantial. Alternatively, the cost of this option is lower if price discounts are expected for GM grain or if price premiums are expected for non-GM grain.

Differences in prices between non-GM and GM corn are likely to be small, if they exist at all, unless a substantial consumer resistance to GM-fed livestock emerges in the United States, or GM corn acreage increases dramatically. Price differences between non-GM and GM soybeans appear more likely because a higher percentage of production is exported, a greater share of production is GM, and soybean meal and oil are jointly produced. If U.S. consumers continue to accept GM soybeans, substantial premiums should not emerge as long as GM soybean acreage does not increase much above 1999 levels. If U.S. consumer resistance emerges to GM soybeans, substantial differences in price may follow.

The attitude of U.S. consumers toward consuming GM products is the key to identifying whether substantial price differences will emerge between non-GM and GM grain. Foreign demand for non-GM grain can be met with market segregation and will not likely result in substantial differences in prices. If positive U.S. consumer attitudes shift away from GM products, then substantial price differences are likely. Producers who receive significant production benefits from GM crops, but who worry about marketability can use *non-recourse marketing assistance* loans to help protect themselves from the uncertainty surrounding consumer acceptance.

Segregating GM and Conventional Crops

The difficulty and cost of segregating GM and conventional crops will vary greatly depending on the kind of farm operation, facilities and equipment one has, and the GM contamination levels one expects. Meeting marketing specifications for conventional crops that allow up to 5% GM contamination will be much easier than meeting "zero tolerance" contamination levels. Farms with multiple growing locations, harvesting equipment and storage bins will be able to start segregating crops with relatively little cost or extra effort, while other farms might experience significant increases in cost per bushel of production. Make sure you have a reasonable expectation of cost increases for segregated crops before you invest too much money in segregation efforts. Choosing varieties has become an increasingly complex task. We are hopeful that this Varietal Trials Results book will be of substantial value to you in making variety choices.

Minnesota VARIETAL TRIALS RESULTS

Successful crop production depends a good deal on selecting varieties best adapted to a specific area. To provide comparative information the Minnesota Agricultural Experiment Station compares varieties in trial plots at St. Paul, Becker, Crookston, Grand Rapids, Lamberton, Morris, Rosemount, St. Paul and Waseca, and on farmers' fields. Crop varieties are grown in replicated plots at each location and factors affecting yield and other characteristics are as nearly the same for all varieties at each location as is possible.

Some crops and crop varieties included in previous editions of Varietal Trials are not included in 1999 performance trials. Questions about them can be addressed to the logical individual listed under "Authors and Researchers," page 9.

The Minnesota Agricultural Experiment Station is grateful for generous financial contributions by the Minnesota Approved Seed Conditioners and Marketing Association and the Minnesota Seed Producers and Promotion Association, which aided greatly in the production and distribution of this edition of Varietal Trials.

The Station also appreciates the cooperation of the Minnesota Barley Growers Association and Minnesota Barley Council, Minnesota Forage and Grassland Council, Minnesota Corn Growers Association and Minnesota Corn Research and Promotion Council, Minnesota Forage and Grassland Council, Minnesota Soybean Growers Association and the Minnesota Association of Wheat Growers and Minnesota Wheat Council in the distribution of this publication, and the Minnesota Crop Improvement Association in the coordination and distribution of these varietal trials results.

Variety Classifications

Varieties of some of the crops evaluated are classified into groups under headings such as "recommended, "special purpose," "other" and "not adequately tested," and some crops may have further groupings within these categories.

"Recommended, special purpose and other classifications are determined each year by the Experiment Station Crop Variety Review Committee. To qualify for the recommended group a variety must excel in important characteristics in three years of testing.

New varieties from other public experiment stations and private plant breeders not sufficiently evaluated in Minnesota are listed as "varieties not adequately tested." Available information is presented for these varieties, but no conclusions are drawn regarding their suitability for Minnesota conditions.

Varieties in an "other varieties" listing usually are inferior in one or more categories in comparative tests. Varieties in the "private" category have performed well, but the Minnesota Agricultural Experiment Station does not make recommendations on them.

Seed of varieties in all these groups may be eligible for certification. Use of certified seed is suggested, but certification in itself does not imply recommendation. Registered and certified seed of most varieties described in this report can be purchased from seed dealers or growers in the Minnesota Crop Improvement Association listing beginning on page 89.

Interpreting the Tables

The LSD (least significant difference) figures beneath yield columns in tables are statistical measures of variability within trials. The LSD is used to determine whether the difference between two yields is due to a genetic difference in the varieties or to other causes, such as environmental variability.

If the yield differences between two varieties equals or exceeds the LSD value for the yield column the higher yielding variety probably was superior in yield. If the difference is less that the LSD the yield difference probably was due to environmental factors. An "NS" notation in a column indicates no significant difference for that characteristic.

These varietal trials are not designed for crop (species) comparisons; the crops are grown on different fields or with different management. The data should be used only to compare varieties within a table.

The relative maturities of varieties are variously indicated in the tables as date of maturity, date of heading or blooming, days to maturity, heading or blooming; or moisture percentage at harvest.

Rate and Date of Planting

This information is given for each crop; in all cases the planting rate is based on normal seedbeds and normal size, good quality seed. The rate used can vary greatly, depending on seed cost, desired stand, expected mortality, ability to emerge, seed weight, seed germination, seedbed condition, depth of planting and planting equipment. The weight given is generally accepted in the United States.

'lant Variety Protection

PVP Barley, oat and wheat varieties covered by the U.S. Plant Variety Protection Act are identified by the VP symbol. When the symbol is followed by (94) seed of that variety may ot be sold by a producer, not even to a :lative or neighbor, without express ermission of the variety's developer/ wner. When the symbol is followed by)ending) the variety should be consid-ed as having PVP (94) protection.

bbreviations

or the sake of economy in many list-igs, the abbreviation "AES" designates gricultural Experiment Station.

uthors and Researchers

uthors of the crop sections are:

lfalfa: C.C. Sheaffer, D.A. Schriever,). Swanson.

lternate Forages: N.J. Ehlke, .J. Vellekson.

arley: K.P. Smith, D.C. Rasmusson, . Schiefelbein

anola: E.A. Oelke, D.G. LeGare, . Andol

orn Grain: T. Hoverstad, D. Hicks, . Nelson, P. Porter, M. Wiens

orn Silage: C.C. Sheaffer, D.R. Hicks, .R. Swanson, T.R. Hoverstad, .L. Halgerson

at: D.D. Stuthman, R. Caspers, . Halstead.

oybean: J.H. Orf, L.L. Hardman, L. Naeve, J. Kurle, P.J. Schaus, . Killam.

/heat: J.A. Anderson, R.H. Busch, . Linkert, L. Matthiesen.

nformation on the reaction of crop varieties to specific pathogens was obtained ainly by R. Dill-Macky, Department of Plant Pathology; D. McVey and Gerald Ochocki, USDA-ARS Cereal Disease Laboratory; and F. Kolb, University of Illinois – Urbana.

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The University of Minnesota Extension Service is once again pleased to be able to help provide the Minnesota Varietal Trials results publication to crop producers free of charge. This publication has always been one of the most requested items of our agricultural publications. The information in this publication has long been a source of information for producers as they make their planting decisions.

This publication will also be available in county Extension offices around the state. Extension appreciates the support of crop-related commodity organizations (corn, soybeans, canola, oat, barley, forages, wheat), and our strong working relationship with faculty at the University of Minnesota Experiment Station. I believe this partnership works well to serve producer needs.

I encourage you to use this information provided to help you plan your next crop. If you have questions, please contact your University of Minnesota Extension Service County Office for assistance.

Sincerely yours,

Charles H. Casey

Charles H. Casey, D.V.M.
Interim Dean and Director

University of Minnesota, U.S. Department of Agriculture, and Minnesota Counties Cooperating

Publication Supervisor: Leland L. Hardman

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Photography: David L. Hansen

Locations of Alfalfa Trials.

ALFALFA

Successful alfalfa production depends on selecting the best varieties for a particular farm. Varieties have been compared for yield in trial plots on Minnesota Agricultural Experiment Station fields: yearly at Rosemount, alternate years at Waseca/Lewiston/Plainview, Lamberton, Morris, Crookston, Stearns County/St. Cloud and Grand Rapids. The trials are conducted using recommended fertility and pest control practices to optimize yield and persistence.

Test results from new and previous seedings of varieties currently available in Minnesota are published as accumulated performance years averaged as a percent of check varieties. Test locations are representative of the risk of winter injury in specific regions of Minnesota: Rosemount and Waseca (replaced by Lewiston/Plainview since 1997) in southeastern, Lamberton in southwestern, Morris in west central, Stearns County in central, Crookston in northwestern and Grand Rapids in northeastern Minnesota (see Test Locations map). Varieties of alfalfa are tested for winter survival and forage quality at selected experiment stations of the universities of Minnesota and Wisconsin-Madison.

Early each fall alfalfa developers and marketers who have provided current contact addresses are asked to declare which varieties approved for seed certification will be marketed in Minnesota for the next seeding year. The varieties reported in those responses are listed on pages 22-26. Each variety is keyed to distributors' addresses and telephone numbers, page 26-27. Varieties seeded in past or present Minnesota yield trials are included in yield tables, pages 12-19; those with winter survival or forage quality performance data are listed on pages 20-21.

Winterhardiness

Severe winters make winterhardiness a primary consideration in variety selection for most areas of Minnesota. The greatest winterhardiness is needed in the west central and northwest Minnesota area (see Winter Injury Potential map, below, right). Because of the high frequency of severe winters in this area, only varieties with very good winter survival should be selected. The east central and southeast area also experience frequent severe winters. The southwest area seldom experiences severe winter injury because of dry soils, high soil potassium levels and neutral soil pH. The northeast area seldom experiences severe winter injury because of dependable snow cover.

Winter Survival

Winter survival of varieties is extremely difficult to determine because winter injury can occur as a result of many different weather events, which cause varied responses in alfalfa plants of differing ages. A standardized test, the North American Alfalfa Improvement Conference (NAAIC) Winter Survival Test, measures the survival of a variety after a severe winter. Tests conducted annually at four or five locations: Arlington, Lancaster and Marshfield, Wis.; and Rosemount and Morris, Minn., are the basis for the winter survival index (WSI), page 20.

The WSI was averaged over all test locations to provide a robust estimate of winter survival and is presented beside yield data in tables on pages 12-19. Varieties are rated from 'Superior' to 'Adequate' in winter survivability. Vernal, a traditional winterhardy variety is rated Superior. Varieties rated 'Adequate' in winter survivability are expected to be injured the most after a severe winter. Varieties tested to date rated above 'Adequate' are shown in yield tables on pages 12-17. Varieties not tested for winter survival are listed alphabetically in tables on pages 17-19. If a variety does not have a WSI, (company has not entered variety in Winter Survival trial) the Fall Dormancy index is the next best indicator of winterhardiness: (1 = very winterhardy; 2 = winterhardy; 3 and 4 = moderately winterhardy).

Fall Dormancy

Fall dormancy ratings are included on pages 22-25, with varieties listed alphabetically. Fall dormancy ratings describe the relative amount of fall growth of alfalfa varieties. Very fall dormant varieties have little fall growth and are slow to recover after cutting. Fall dormant varieties are adaptable to all areas of the state. Moderately fall dormant varieties produce good fall growth, are characterized by rapid recovery after harvest, and usually reach 1/10 bloom several days earlier than more dormant varieties. Although increased fall dormancy has traditionally been associated with greater

inter survival, the WSI is now consid-ed a better predictor of winter survival.

'orage Yield

lfalfa yield results are presented in two arts, a summary over all locations, plus outheastern sites, pages 12-15, and west, entral and northeast sites, pages 16-19.

ield results are expressed as a percent of ie average check varieties identified in ach table. Alfalfa yield of a given vari-y is best predicted after three seedings test locations have been measured ver 4 years of stand life (the 3 years fter seeding). Test data from a single st site or region of the state is less ro-ust than performance over several sites.

ariety yield performance is not as dif-rent the first two years after seeding as ith older stands. Thus, to choose a va-ety for short-term stands, 1 to 2 years fter seeding, use the all-location yield or 1+2 years after seeding. For long-rm stands, choose varieties based on ieir performance over all locations 3 ears after seeding. Varieties with less an three tests, pages 15 and 19, are not ccurately characterized for yield perfor-iance.

'orage Quality

lfalfa varieties differ in forage quality r feeding value. Alfalfa varieties have een evaluated for forage quality at osemount since 1991. An NAAIC tandardized Forage Quality Test has een performed at Arlington, Wis., and osemount, Minn., since 1995. Varieties the seeding year are evaluated on one ut taken in late August. Production ear evaluation (first year after seeding nly) is done by analyzing each of three uttings taken at late bud to one-tenth loom stages of maturity.

elative Feed Value index ranks varieties n their potential digestible dry matter ntake. Milk per ton is estimated using a ariety's crude protein and neutral deter-ent fiber concentrations to determine ie amount of alfalfa needed to match the rotein and energy needs of a 1,350-ound cow producing 60 pounds of milk er day with a diet including corn grain nd minerals. Milk per acre quantifies the forage quality of an alfalfa variety as "tons per acre" multiplied by "milk per ton" (theoretical milk production per ton, calculated from protein and fiber values).

The LSD (Least Significant Difference), shown below the forage quality performance data, in page 21, is a statistical measure of variability within the trial. LSD is used to determine whether the differences between two numbers is due to genetic difference in the varieties. If the difference between two varieties equals or exceeds the LSD value for the column, you can conclude that the higher quality variety was superior in quality. If the difference is less, greater attention should be given to other traits which are also important in making your variety choices.

Disease Resistance

Alfalfa root and crown diseases occur in most Minnesota soils. The most important diseases are Bacterial wilt, Phytophthora root rot, Fusarium wilt, Anthracnose, Verticillium wilt, and Aphanomyces root rot. Plant resistance is available for all six diseases. The variety resistance ratings for each disease are presented on pages 22-25. While moderate resistance (MR) to a disease will provide protection to a variety under most conditions, either resistance (R) or high resistance (HR) is required for protection under severe disease conditions.

Winter injury can be the result of a combination of injury from cold temperatures and from root and crown diseases. Under some conditions disease resistances can compensate for lesser levels of cold tolerance. While all varieties can benefit from improved disease resistance, it is especially important for moderately fall-dormant varieties to have at least (R) levels of disease resistance to stay productive for more than 2 years after the seeding year under intensive management (four cuts/season) in the east central and southeast area of Minnesota.

Bacterial Wilt – This disease is prevalent in most areas of the state. Wilt-susceptible varieties are poor risks and should not be grown. They generally show losses in stand by the end of the second year after seeding. In some cases, where infection is severe, stand losses are often observed by the end of the first year after seeding. Stand reductions after winter are often due to a combination of wilt damage and winter injury.

Phytophthora Root Rot – This fungal disease is a major concern on poorly drained soils especially in the east central and southeast area of the state. It can cause stand losses of seedlings, and can contribute to lower productivity in older stands if the soil remains wet for a week or more.

Fusarium Wilt – The fungus that causes Fusarium wilt is present in most soils. It contributes to stand decline mainly in combination with other disease organisms. Therefore, resistance to Fusarium wilts in addition to resistance to both Bacterial wilt and Phytophthora root rot contributes to longer stand life.

Anthracnose – This fungus disease was first found in Minnesota in 1978 and has become more prevalent each year, but only in the east central and southeast area. It infects stems and crowns and kills susceptible plants. The disease is favored by hot, moist conditions, and will therefore be most frequently observed in southeast Minnesota.

Verticillium Wilt – This potentially destructive fungus disease was first found in several eastern Minnesota fields in 1981. It has usually been found in 2- or 3-year-old fields. Its spread in the state has been slow. Planting resistant varieties will help provide insurance for long-life stands. Varieties having at least a low level of resistance are indicated on pages 22-25.

Aphanomyces Root Rot – This disease is associated with very slowly drained soils and is easily confused with Phytophthora root rot. It stunts and kills seedlings as well as causing a chronic root disease in established plants. Few cases of this disease have been identified in Minnesota. Consider planting a variety with Aphanomyces resistance if Phytophthora root rot resistant varieties fail to persist.

Yields with Winter Survival Index at All and Southeastern sites[1] as % of checks for all seedings with 1 or more harvest years, 1983-1999.

Variety, By WSI Category Then by year 1+2	Winter Survival Index[2]	Average Yield Yor Years 1, 1+2, And 3 After Seeding Year							
		All Sites			Test Sites[3]	Production[4]	Rosemount, Waseca[5],		Plainview
		1	1+2	3	(Seedings)	Years 1-3	1	1+2	3
Checks, T/Ac 15%mc Hay		**5.99**	**5.71**	**5.01**	48	115	**6.51**	**6.35**	**5.91**
Superior Winter Survival									
ABT 205	1.6	102	102	106	7	18	107	104	108
Vernal-ck	1.9	100	100	101	51	115	100	101	102
Very Good Winter Survival									
ABT 350	2.8	115	115	121	5	6	114	115	121
XGrazer	2.8	119	114	113	1	3	–	–	–
Power Plant	2.5	108	111	–	1	2	108	111	–
Extend	2.9	111	110	101	3	8	108	109	103
5454	2.3	107	109	109	23	47	108	110	113
620	2.4	108	109	108	12	24	109	111	110
WinterGreen	2.5	108	109	139	5	8	112	116	–
Vitro	2.6	111	109	104	4	7	111	108	104
DK142	2.9	109	109	120	2	5	109	109	120
Defiant	2.3	106	107	107	7	15	106	109	111
Avalanche+Z	2.4	105	107	104	8	19	112	110	102
Notice	2.6	106	107	108	3	9	109	109	110
WinterGold	2.8	108	107	101	4	4	101	103	101
9429	2.8	108	107	101	4	4	102	104	101
Value Plus	2.3	106	106	102	1	3	106	106	102
WinterStar	2.4	107	106	105	8	14	110	108	105
Garst 645	2.8	107	106	118	13	30	107	107	107
Innovator+Z	2.3	103	105	105	5	12	108	109	105
WinterKing	2.5	106	105	107	7	9	107	106	107
DK127	2.6	105	105	108	13	30	110	108	110
ABT 405	2.6	103	105	111	3	9	108	108	115
Rainier	2.9	107	105	102	7	13	108	106	105
Exceed	2.8	108	104	102	3	8	106	104	104
DK140	2.9	106	104	–	10	10	108	104	–
MP2000	2.7	101	103	113	3	9	107	107	115
Rushmore	2.7	105	103	100	5	14	108	106	98
WL 232 HQ	2.8	106	103	–	6	6	106	103	–
Feast+EV	2.2	105	102	–	3	4	107	–	–
Sprint	2.6	101	102	101	3	3	101	102	101
Complete	2.7	101	102	109	3	7	111	110	110
LegenDairy 2.0	2.8	107	102	101	3	6	104	100	101
Forerunner	2.7	105	99	98	4	9	104	97	100
Spredor 3..ck	2.0	100	98	96	18	35	100	96	100
AmeriStand 201+Z	2.0	108	–	–	5	3	107	–	–
Rebound 4.2	2.4	108	–	–	5	2	–	–	–
DK134	2.5	104	–	–	7	4	102	–	–
Breakout	2.5	106	–	–	3	3	108	–	–
Emperor	2.6	101	–	–	2	2	101	–	–
DK124	2.6	105	–	–	9	6	108	–	–
6410	2.7	112	–	–	2	2	112	–	–
53V63	2.8	105	–	–	6	6	105	–	–
Geneva	2.8	108	–	–	6	4	109	–	–
MultiMist	2.7	–	–	–	0	0	–	–	–
6310	2.8	–	–	–	0	0	–	–	–

See footnotes, page 15.

ıriety, / WSI Category ıen by year 1+2	Winter Survival Index[2]	Average Yield Yor Years 1, 1+2, And 3 After Seeding Year							
		All Sites			Test Sites[3] (Seedings)	Production[4] Years 1-3	Rosemount, Waseca[5],		Plainview
		1	1+2	3			1	1+2	3
ıecks, T/Ac 15%mc Hay		**5.99**	**5.71**	**5.01**	48	115	**6.51**	**6.35**	**5.91**
ood Winter Survival									
agnum V	3.0	111	113	120	11	12	108	110	120
:cel	3.1	117	111	–	1	2	117	111	–
gHorn	3.1	109	108	98	4	8	108	107	98
;pen	3.2	112	108	98	3	8	106	105	101
vard	3.3	111	108	99	7	10	109	105	97
312..	3.0	106	107	109	15	29	109	110	112
-I 767	3.0	107	106	104	4	9	107	106	104
ɔlumbia 2000	3.1	109	106	98	6	10	109	108	103
ıart	3.2	107	106	111	13	34	109	108	108
;e	3.1	101	105	106	4	7	99	104	106
-I 757	3.1	105	105	–	2	3	105	105	–
king 1	3.0	104	104	103	10	24	107	109	105
ıralfa 32 IQ	3.0	106	103	–	4	5	104	103	–
ıctator	3.1	105	103	102	3	6	105	103	102
ba 2888	3.2	105	103	106	4	10	105	103	106
X141	3.5	105	103	–	10	10	106	104	–
198	3.1	100	102	101	3	8	102	103	103
ghtning	3.3	96	100	106	3	9	108	103	107
ıardian	3.0	99	99	108	3	9	115	113	117
ɔrtress	3.8	94	97	90	8	24	105	102	84
3Q60	3.0	104	–	–	9	6	102	–	–
Q 314	3.0	107	–	–	4	3	107	–	–

'ields with 3 or more seedings but no winter survival test at All and Southeastern sites[1] as % of checks ɔr all seedings with 1 or more harvest years, 1983-1999.

ıriety, phabetical ɔder	Winter Survival Index[2]	Average Yield Yor Years 1, 1+2, And 3 After Seeding Year							
		All Sites			Test Sites[3] (Seedings)	Production[4] Years 1-3	Rosemount, Waseca[5],		Plainview
		1	1+2	3			1	1+2	3
ıecks, T/Ac 15%mc Hay		**5.99**	**5.71**	**5.01**	48	115	**6.51**	**6.35**	**5.91**
30		105	107	109	11	29	107	110	113
31	–	108	108	112	11	25	110	109	113
326	–	112	113	100	6	8	114	114	100
555 ML	–	107	107	110	6	15	109	108	108
29 (Max)	–	114	107	101	4	11	112	108	101
452ML	–	101	104	107	4	10	106	104	106
-295	–	108	107	95	3	8	108	107	95
-395	–	107	107	108	5	9	107	107	108
ɔound	–	108	107	118	4	3	108	107	118
finity+Z	–	105	106	102	3	8	102	105	103
fagraze	–	103	100	99	7	19	103	102	85
faStar	–	109	105	110	3	7	109	108	117
pha 2001	–	99	102	107	4	9	103	101	–
neriGraze 401+Z	–	108	106	113	4	7	103	103	113
neriGuard 301	–	101	99	–	4	6	98	99	–
ɔollo Supreme	–	100	101	105	7	20	106	107	108
ınquet	–	104	98	96	3	8	101	98	99
azer XL	–	108	103	101	3	8	106	101	–
ɔunty	–	117	113	111	6	13	111	108	108
own II	–	105	106	116	6	15	117	112	–
ystal	–	104	103	112	6	17	100	97	95

ee footnotes, page 15.

Variety, Alphabetical Order	Winter Survival Index[2]	Average Yield Yor Years 1, 1+2, And 3 After Seeding Year							
		All Sites			Test Sites[3]	Production[4]	Rosemount, Waseca[5],		Plainview
		1	1+2	3	(Seedings)	Years 1-3	1	1+2	3
Checks, T/Ac 15%mc Hay		**5.99**	**5.71**	**5.01**	48	115	**6.51**	**6.35**	**5.91**
Demand	–	103	102	106	4	9	108	105	108
Depend+EV	–	106	104	115	4	9	106	104	100
Dividend	–	103	104	100	9	24	103	102	104
Dominator	–	107	106	108	4	9	109	108	108
Empire	–	102	101	102	6	12	104	100	96
Enhancer	–	104	106	115	3	9	109	110	113
Evolution	–	107	107	103	4	10	111	112	101
FQ 315	–	109	110	102	4	4	107	108	102
Gateway	–	113	109	–	3	4	112	109	–
GH 750	–	104	–	–	3	1	104	–	–
GH 755	–	117	111	91	4	9	112	109	91
GH 766	–	105	105	98	8	13	103	104	97
GH 787	–	108	107	103	6	14	109	106	106
Gold Plus	–	102	104	116	4	6	102	104	116
Good as Gold	–	113	110	117	7	18	116	109	99
GreenField	–	106	104	100	3	7	104	103	100
Imperial	–	109	109	108	5	9	109	109	108
Jade II	–	106	105	–	4	5	107	–	–
Laser	–	111	112	102	3	7	116	115	102
Legend Gold	–	110	108	98	4	3	110	108	98
Magnum III	–	109	110	114	9	25	111	110	110
Magnum III-Wet	–	111	111	99	6	12	111	111	99
Mainstay	–	106	104	101	4	8	106	104	101
Mariner	–	114	110	103	3	8	109	107	107
Milk RIver	–	118	111	–	6	5	104	–	–
Monument	–	103	108	108	6	13	109	107	–
Multi 5301	–	104	104	–	5	6	102	104	–
MultiQueen	–	117	111	–	3	5	104	–	–
Nemesis	–	102	104	106	4	9	104	105	106
Persist	–	108	112	–	7	11	108	112	–
Pointer	–	–	–	–	3	0	–	–	–
Proof	–	100	98	98	4	11	121	121	–
Quantum	–	114	110	99	4	9	109	107	99
Rhino	–	105	102	–	3	5	102	100	–
Rustler II	–	111	111	–	5	8	111	111	–
Spirit	–	105	113	–	4	5	108	114	–
Sterling	–	106	105	108	4	12	109	106	108
Surpass	–	110	111	107	8	21	113	113	108
Target II	–	112	109	96	4	10	117	110	84
Target II Plus	–	110	114	125	4	7	112	115	125
TMF 421	–	105	103	–	6	7	103	103	–
TMF Generation	–	102	102	105	5	13	109	107	111
TMF Multi-plier II	–	106	103	97	5	10	106	103	98
Voyager II	–	108	109	107	7	16	109	110	104
Webfoot MPR	–	107	103	–	5	9	105	102	–
WetLand	–	106	105	103	6	10	106	105	103
WL 252 HQ	–	101	105	113	5	10	110	110	113
WL 324	–	110	109	92	5	8	107	111	–
WL 325 HQ	–	109	108	96	7	12	109	107	97
Wrangler	–	104	105	106	5	14	105	108	114

See footnotes, page 15.

'ields with less than 3 seedings* but no winter survival test at All and Southeastern sites[1], yields as % of hecks for all seedings with one or more harvest years, 1983-1999.

ariety, phabetical rder	Winter Survival Index[2]	Average Yield Yor Years 1, 1+2, And 3 After Seeding Year							
		All Sites			Test Sites[3] (Seedings)	Production[4] Years 1-3	Rosemount, Waseca[5],		Plainview
		1	1+2	3			1	1+2	3
hecks, T/Ac 15%mc Hay		**5.99**	**5.71**	**5.01**	48	115	**6.51**	**6.35**	**5.91**
3V08	–	102	–	–	2	2	–	–	–
3T 400SCL	–	104	–	–	1	1	104	–	–
ɔundance	–	109	111	110	2	5	109	111	110
ɪeriGuard 302+Z	–	–	–	–	1	0	–	–	–
iba 2444	–	105	106	–	2	4	–	–	–
lean Sweep 1000	–	103	102	–	1	2	103	102	–
ɔrecast 3000	–	101	–	–	2	2	–	–	–
arst 645-II	–	–	–	–	1	0	–	–	–
reenFeast	–	113	109	103	1	3	113	109	103
unter	–	–	–	–	1	0	–	–	–
ɜgenDairy	–	118	119	100	2	5	126	135	–
lagnum IV	–	110	108	100	2	5	110	108	100
etYield 500	–	–	–	–	1	0	–	–	–
ɜsture Plus	–	113	114	–	1	2	113	114	–
latinum	–	108	–	–	2	1	108	–	–
ristine	–	105	–	–	2	2	105	–	–
ɜdiant	–	108	110	–	1	2	108	110	–
ɔur	–	107	–	–	2	2	107	–	–
ampede	–	111	112	106	2	5	111	112	106
ynergy	–	104	103	–	1	2	104	103	–
ltraLac	–	–	–	–	1	0	–	–	–
L 327	–	–	–	–	2	0	–	–	–
elder	–	102	107	107	2	4	102	107	107

/arieties with less than 3 seedings CANNOT be reliably compared with those in previous tables with 3 or more seedings.

Locations: Ro-Wa-SE: Rosemount-Waseca-SE (Lewiston/Plainview), Mo-Cr-ST: Morris-Crookston-Stearns Co.(~St.Cloud), Lamberton, Grand Rapids.

Winter Survival Index from joint Minnesota-Wisconsin 1996-99 trials.

Each seeding in any location counts as one "Test." Test data from experimental seed is retired as data from tests on commercial seed is sufficient to replace them.

Total production years (after seed year) for any location with reliable data. Yr1+2 averages 2 production years. Seed years or production years that winter killed or developed unacceptably variable stands are excluded.

Tests were discontinued at Waseca after 1994, replaced by a SE site near Plainview.

Yields with Winter Survival Index at West, Central and NE sites[1], yields as % of checks for all seedings with one or more harvest years, 1983-1999.

Variety, By WSI Category Then by year 1+2	WSI[2]	Average Yield For Years 1, 1+2, And 3 After Seeding Year										
		ALL Sites		Mo-Cr[3]-Stearns Co.			Lamberton			Grand Rapids		
		Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3
Checks, T/Ac 15%mc Hay		**5.71**	**5.01**	**5.88**	**5.37**	**5.04**	**6.23**	**5.90**	**3.99**	**4.10**	**3.92**	**3.74**
Superior Winter Survival												
ABT 205	1.6	102	106	108	109	110	80	87	101	97	103	102
Vernal-ck	1.9	100	101	99	99	100	100	100	100	101	101	100
Very Good Winter Survival												
ABT 350	2.8	115	121	117	–	–	–	–	–	–	–	–
XGrazer	2.8	114	113	119	114	113	–	–	–	–	–	–
Power Plant	2.5	111	–	–	–	–	–	–	–	–	–	–
Extend	2.9	110	101	–	–	–	–	–	–	115	111	98
5454	2.3	109	109	110	114	120	95	98	109	108	107	102
620	2.4	109	108	117	118	105	95	97	105	–	–	–
WinterGreen	2.5	109	139	–	–	–	–	–	–	103	102	139
Vitro	2.6	109	104	110	109	–	–	–	–	–	–	–
DK142	2.9	109	120	–	–	–	–	–	–	–	–	–
Defiant	2.3	107	107	112	109	101	90	98	108	–	–	–
Avalanche+Z	2.4	107	104	110	116	112	79	88	108	99	103	95
Notice	2.6	107	108	119	119	110	88	94	106	–	–	–
WinterGold	2.8	107	101	114	–	–	–	–	–	–	–	–
9429	2.8	107	101	115	–	–	–	–	–	–	–	–
Value Plus	2.3	106	102	–	–	–	–	–	–	–	–	–
WinterStar	2.4	106	105	108	106	–	100	–	–	104	–	–
Garst 645	2.8	106	118	112	111	119	102	101	128	–	–	–
Innovator+Z	2.3	105	105	112	–	–	79	87	106	–	–	–
WinterKing	2.5	105	107	107	–	–	108	–	–	101	–	–
DK127	2.6	105	108	104	106	114	91	91	106	108	110	95
ABT 405	2.6	105	111	115	115	112	86	92	106	–	–	–
Rainier	2.9	105	102	115	–	–	98	100	–	100	103	98
Exceed	2.8	104	102	–	–	–	–	–	–	112	103	100
DK140	2.9	104	–	112	111	–	96	97	–	101	–	–
MP2000	2.7	103	113	112	114	119	84	87	106	–	–	–
Rushmore	2.7	103	100	120	117	101	91	93	103	98	94	100
WL 232 HQ	2.8	103	–	109	–	–	101	–	–	–	–	–
Feast+EV	2.2	102	–	104	102	–	–	–	–	–	–	–
Sprint	2.6	102	101	–	–	–	–	–	–	–	–	–
Complete	2.7	102	109	–	–	–	83	91	107	–	–	–
LegenDairy 2.0	2.8	102	101	115	–	–	–	–	–	–	–	–
Forerunner	2.7	99	98	–	–	–	–	–	–	108	103	96
Spredor 3..ck	2.0	98	96	104	103	–	99	101	–	100	96	100
AmeriStand 201+Z	2.0	–	–	109	–	–	–	–	–	–	–	–
Rebound 4.2	2.4	–	–	111	–	–	105	–	–	–	–	–
DK134	2.5	–	–	110	–	–	–	–	–	100	–	–
Breakout	2.5	–	–	–	–	–	–	–	–	104	–	–
Emperor	2.6	–	–	–	–	–	–	–	–	–	–	–
DK124	2.6	–	–	104	–	–	103	–	–	104	–	–
6410	2.7	–	–	–	–	–	–	–	–	–	–	–
53V63	2.8	–	–	109	–	–	99	–	–	106	–	–
Geneva	2.8	–	–	104	–	–	111	–	–	–	–	–
MultiMist	2.7	–	–	–	–	–	–	–	–	–	–	–
ABT 227 LH	2.7	–	–	–	–	–	–	–	–	–	–	–

See footnotes, page 19.

ariety, lphabetical rder	WSI[2]	Average Yield For Years 1, 1+2, And 3 After Seeding Year										
		ALL Sites		Mo-Cr[3]-Stearns Co.			Lamberton			Grand Rapids		
		Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3
hecks, T/Ac 15%mc Hay		**5.71**	**5.01**	**5.88**	**5.37**	**5.04**	**6.23**	**5.90**	**3.99**	**4.10**	**3.92**	**3.74**
310	2.8	–	–	–	–	–	–	–	–	–	–	–
lagnum V	3.0	113	120	116	118	–	109	110	–	–	–	–
xcel	3.1	111	–	–	–	–	–	–	–	–	–	–
igHorn	3.1	108	98	114	–	–	–	–	–	–	–	–
spen	3.2	108	98	–	–	–	–	–	–	125	116	94
ward	3.3	108	99	–	–	–	–	–	–	119	115	101
312..	3.0	107	109	103	108	115	98	99	100	109	106	107
H 767	3.0	106	104	–	–	–	–	–	–	–	–	–
olumbia 2000	3.1	106	98	106	–	–	104	–	–	116	108	94
art	3.2	106	111	103	104	113	106	104	112	117	109	108
ce	3.1	105	106	107	–	–	–	–	–	–	–	–
H 757	3.1	105	–	–	–	–	–	–	–	–	–	–
iking 1	3.0	104	103	108	107	104	87	90	97	112	112	106
aralfa 32 IQ	3.0	103	–	111	–	–	–	–	–	–	–	–
actator	3.1	103	102	–	–	–	–	–	–	–	–	–
iba 2888	3.2	103	106	–	–	–	–	–	–	–	–	–
K141	3.5	103	–	109	104	–	104	103	–	96	–	–
498	3.1	102	101	–	–	–	–	–	–	98	99	99
ightning	3.3	100	106	111	121	109	70	77	102	–	–	–
uardian	3.0	99	108	104	105	110	77	80	99	–	–	–
ortress	3.8	97	90	63	80	98	99	106	89	108	103	98
3Q60	3.0	–	–	105	–	–	107	–	–	101	–	–
Q 314	3.0	–	–	108	–	–	–	–	–	–	–	–

'ields with 3 or more seedings, but no winter survival test, at west, central and NE sites,[1]
'ields as % of checks for all seedings with one or more harvest years, 1983-1999.

ariety, lphabetical rder	WSI[2]	Average Yield For Years 1, 1+2, And 3 After Seeding Year										
		ALL Sites		Mo-Cr[3]-Stearns Co.			Lamberton			Grand Rapids		
		Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3
hecks, T/Ac 15%mc Hay		**5.71**	**5.01**	**5.88**	**5.37**	**5.04**	**6.23**	**5.90**	**3.99**	**4.10**	**3.92**	**3.74**
30	–	107	109	100	102	100	105	107	107	102	99	112
31	–	108	112	115	119	114	94	97	110	–	–	–
326	–	113	100	115	–	–	104	–	–	–	–	–
555 ML	–	107	110	110	112	108	93	99	113	–	–	–
29 (Max)	–	107	101	–	–	–	–	–	–	119	106	101
452ML	–	104	107	109	112	109	80	92	107	–	–	–
-295	–	107	95	–	–	–	–	–	–	–	–	–
-395	–	107	108	109	–	–	108	–	–	–	–	–
bound	–	107	118	–	–	–	–	–	–	–	–	–
ffinity+Z	–	106	102	–	–	–	–	–	–	110	107	100
lfagraze	–	100	99	102	97	106	103	101	117	106	103	94
lfaStar	–	105	110	117	–	–	101	99	103	–	–	–
lpha 2001	–	102	107	118	122	109	71	81	105	–	–	–
meriGraze 401+Z	–	106	113	124	–	–	–	–	–	–	–	–
meriGuard 301	–	99	–	98	–	–	103	100	–	–	–	–
pollo Supreme	–	101	105	83	90	103	99	100	99	116	107	112
anquet	–	98	96	–	–	–	–	–	–	110	98	94
lazer XL	–	103	101	106	101	98	111	105	103	–	–	–
ounty	–	113	111	124	118	114	–	–	–	–	–	–
rown II	–	106	116	88	96	107	109	110	124	–	–	–
rystal	–	103	112	104	104	112	118	117	144	–	–	–

'ee footnotes, page 19.

Variety, Alphabetical Order	WSI[2]	Average Yield For Years 1, 1+2, And 3 After Seeding Year										
		ALL Sites		Mo-Cr[3]-Stearns Co.			Lamberton			Grand Rapids		
		Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3
Checks, T/Ac 15%mc Hay		**5.71**	**5.01**	**5.88**	**5.37**	**5.04**	**6.23**	**5.90**	**3.99**	**4.10**	**3.92**	**3.74**
Demand	–	102	106	–	–	–	90	94	104	–	–	–
Depend+EV	–	104	115	–	–	–	–	–	–	107	103	130
Dividend	–	104	100	112	114	99	77	88	100	112	109	98
Dominator	–	106	108	–	–	–	101	99	–	–	–	–
Empire	–	101	102	110	111	110	80	87	99	103	–	–
Enhancer	–	106	115	–	–	–	93	96	117	–	–	–
Evolution	–	107	103	106	105	–	–	–	–	101	98	105
FQ 315	–	110	102	112	–	–	–	–	–	–	–	–
Gateway	–	109	–	115	–	–	–	–	–	–	–	–
GH 750	–	–	–	–	–	–	–	–	–	–	–	–
GH 755	–	111	91	130	117	–	–	–	–	–	–	–
GH 766	–	105	98	105	–	–	105	–	–	107	108	99
GH 787	–	107	103	–	–	–	–	–	–	104	109	98
Gold Plus	–	104	116	103	–	–	–	–	–	–	–	–
Good as Gold	–	110	117	109	113	117	113	104	135	108	108	115
GreenField	–	104	100	–	–	–	109	106	–	–	–	–
Imperial	–	109	108	109	–	–	–	–	–	–	–	–
Jade II	–	105	–	–	–	–	103	104	–	–	–	–
Laser	–	112	102	115	117	–	102	103	–	–	–	–
Legend Gold	–	108	98	–	–	–	–	–	–	–	–	–
Magnum III	–	110	114	100	106	103	111	116	132	114	104	108
Magnum III-Wet	–	111	99	110	111	–	–	–	–	–	–	–
Mainstay	–	104	101	–	–	–	–	–	–	–	–	–
Mariner	–	110	103	–	–	–	–	–	–	124	115	99
Milk River	–	111	–	133	122	–	117	108	–	–	–	–
Monument	–	108	108	105	117	117	80	92	105	111	113	103
Multi 5301	–	104	–	104	–	–	106	–	–	–	–	–
MultiQueen	–	111	–	142	127	–	105	102	–	–	–	–
Persist	–	112	–	109	116	–	107	105	–	–	–	–
Pointer	–	–	–	–	–	–	–	–	–	–	–	–
Proof	–	98	98	96	100	99	83	83	89	100	90	105
Quantum	–	110	99	127	118	–	–	–	–	–	–	–
Rhino	–	102	–	111	–	–	–	–	–	–	–	–
Rustler II	–	111	–	108	–	–	–	–	–	–	–	–
Spirit	–	113	–	104	–	–	103	–	–	–	–	–
Sterling	–	105	108	117	119	117	88	91	101	–	–	–
Surpass	–	111	107	112	104	105	95	108	105	111	108	110
Target II	–	109	96	108	111	106	–	–	–	105	105	97
Target II Plus	–	114	125	105	–	–	–	–	–	–	–	–
TMF 421	–	103	–	106	–	–	108	–	–	102	–	–
TMF Generation	–	102	105	112	108	105	91	93	99	–	–	–
TMF Multi-plier II	–	103	97	105	–	–	104	–	–	108	103	97
Voyager II	–	109	107	115	116	111	99	100	107	–	–	–
Webfoot MPR	–	103	–	119	108	–	103	100	–	–	–	–
WetLand	–	105	103	–	–	–	–	–	–	–	–	–
WL 252 HQ	–	105	113	88	97	–	112	107	–	–	–	–
WL 324	–	109	92	109	110	–	–	–	–	115	107	92
WL 325 HQ	–	108	96	106	106	–	–	–	–	115	113	96
Wrangler	–	105	106	100	106	103	97	98	106	110	107	100

See footnotes, page 19.

'ields with less than 3 seedings* but no winter survival test, at west, central and NE sites,[1] 'ields as % of checks for all seedings with one or more harvest years, 1983-1999.

ariety,		Average Yield For Years 1, 1+2, And 3 After Seeding Year										
lphabetical		ALL Sites		Mo-Cr[3]-Stearns Co.			Lamberton			Grand Rapids		
rder	WSI[2]	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3	Yr1	Yr1+2	Yr3
hecks, T/Ac 15%mc Hay		**5.71**	**5.01**	**5.88**	**5.37**	**5.04**	**6.23**	**5.90**	**3.99**	**4.10**	**3.92**	**3.74**
3V08	–	–	–	103	–	–	102	–	–	–	–	–
BT 400SCL	–	–	–	–	–	–	–	–	–	–	–	–
bundance	–	111	110	–	–	–	–	–	–	–	–	–
meriGuard 302+Z	–	–	–	–	–	–	–	–	–	–	–	–
iba 2444	–	106	–	104	104	–	106	107	–	–	–	–
lean Sweep 1000	–	102	–	–	–	–	–	–	–	–	–	–
orecast 3000	–	–	–	99	–	–	104	–	–	–	–	–
arst 645-II	–	–	–	–	–	–	–	–	–	–	–	–
reenFeast	–	109	103	–	–	–	–	–	–	–	–	–
unter	–	–	–	–	–	–	–	–	–	–	–	–
egenDairy	–	119	100	–	–	–	–	–	–	109	104	100
lagnum IV	–	108	100	–	–	–	–	–	–	–	–	–
etYield 500	–	–	–	–	–	–	–	–	–	–	–	–
asture Plus	–	114	–	–	–	–	–	–	–	–	–	–
latinum	–	–	–	–	–	–	–	–	–	–	–	–
ristine	–	–	–	–	–	–	–	–	–	–	–	–
adiant	–	110	–	–	–	–	–	–	–	–	–	–
pur	–	–	–	–	–	–	–	–	–	–	–	–
tampede	–	112	106	–	–	–	–	–	–	–	–	–
ynergy	–	103	–	–	–	–	–	–	–	–	–	–
ltraLac	–	–	–	–	–	–	–	–	–	–	–	–
/L 327	–	–	–	–	–	–	–	–	–	–	–	–
ielder	–	107	107	–	–	–	–	–	–	–	–	–

Varieties with less than 3 seedings CANNOT be reliably compared with those in previous tables with 3 or more seedings.

Locations: Ro-Wa-SE: Rosemount-Waseca-SE (Lewiston/Plainview), Mo-Cr-ST: = Morris-Crookston-Stearns Co.(~St.Cloud), Lamberton, Grand Rapids.

Winter Survival Index from joint Minnesota-Wisconsin 1996-99 trials.

Tests were discontinued at Crookston after 1995, replaced by a Stearns Co. site near St. Cloud.

Alfalfa Winter Survival test results for Wisconsin and Minnesota, planted in 1998 and rated April-May, 1999.

	Winter Survival Index: 1=Superior, 2=Very Good, 3=Good, 4=Adequate, 5=Low, 6=No Winter Survival				
Variety	Arlington, Wis.	Lancaster, Wis.	Rosemount, Minn.	Morris, Minn.	MEAN
Beaver (index 1 check)	1.1	1.0	1.0	1.0	1.0
Vernal (index 2 check)	1.8	1.8	2.0	2.1	1.9
Ameristand 201+Z	1.2	1.8	2.4	2.7	2.0
526 (index 2 check)	2.2	2.4	2.0	1.5	2.0
Rebound	2.3	2.3	2.8	2.3	2.4
WinterKing	1.7	2.9	2.6	2.6	2.5
Breakout	2.1	2.6	2.9	2.6	2.5
Emperor	2.5	2.8	2.7	2.5	2.6
DK 134	2.3	2.7	3.0	2.7	2.7
DK 140	2.3	2.9	2.8	2.9	2.7
6410	2.3	2.6	3.3	2.6	2.7
ABT 227 LH	2.4	2.5	3.1	3.0	2.7
53V63	2.1	3.4	3.0	2.7	2.8
DK 124	2.7	2.9	2.8	2.7	2.8
WinterGold	2.8	2.9	2.9	2.6	2.8
XGrazer	2.5	2.8	2.7	3.2	2.8
WL 232 HQ	2.9	2.5	3.0	2.9	2.8
6310	2.5	2.7	3.2	2.9	2.8
ABT 350	2.6	3.0	2.8	2.9	2.8
9429	2.6	3.0	3.0	2.8	2.8
Ranger (index 3 check)	2.6	3.0	3.1	3.0	2.9
Geneva	2.5	3.1	3.3	3.0	3.0
FQ 314	3.1	2.8	3.2	2.8	3.0
Magnum V	3.4	2.7	2.9	2.9	3.0
Baralfa 32 IQ	3.0	2.9	3.1	3.2	3.0
53Q60	2.6	3.0	3.0	3.5	3.0
Lactator	3.2	2.9	3.2	3.1	3.1
GH 757	3.3	3.5	3.1	2.6	3.1
Dart (index 3 check)	3.7	3.2	3.0	3.0	3.2
A9503	2.8	3.3	3.6	3.8	3.4
DK 141	3.5	3.5	3.6	3.4	3.5
Fortress (index 4 check)	3.4	4.0	4.0	4.0	3.9
G2852 (index 4 check)	4.2	4.1	4.0	4.0	4.1
Archer (index 5 check)	4.9	4.5	4.8	3.4	4.4
Southern Special (6 check)	5.1	5.1	5.1	5.2	5.1
MOAPA 69 (index 6 check)	5.9	5.9	5.9	6.0	5.9
CUF 101 (index 6 check)	6.0	6.0	6.1	6.0	6.0

Forage quality as Relative Feed Value and milk per acre of alfalfa varieties, % of checks.

Seed yrs 1991-97 Minn., 95-97 Wis. Production yrs. 1992-98 Minn, 96-98 Wis.

Variety	RFV[2]	Milk/Acre	N
29 [Max]	104	110	2
3Q60	104	106	2
3V63	103	105	2
454	102	105	1
30	107	109	1
498	102	**118**	2
326	104	113	2
ABT 205	102	110	2
Baralfa 32 IQ	103	100	2
Breakout	105	111	2
Ciba 2888	102	112	2
Dart	106	99	1
DK 124	106	111	2
DK 127	105	113	5
DK 134	104	105	2
DK 140	100	102	2
Dominator	105	98	1
Exceed	102	114	2
Extend	102	111	2
FQ 314	105	118	2
Garst 645	106	105	1
Geneva	104	110	2
GH 755	108	102	1
GH 757	99	104	2
GH 766	102	100	2
GH 767	105	109	4
GH 787	**105**	109	4
Good As Gold	105	102	1
Imperial	102	109	1
Innovator +Z	103	105	2
Legend Gold	104	117	2
LegenDairy	110	104	1
Lightning	102	111	2
Magnum III	102	105	1
Magnum III-Wet	**111**	102	1
Magnum IV	99	102	1
Mainier	103	110	2
Mushmore	98	105	1
Spirit	98	114	2
Sprint	105	112	2
Spur	103	109	1
Sterling	103	107	1
Target II Plus	105	**108**	1
Viking 1	106	103	1
WinterKing	103	107	2
WL 252 HQ	105	108	3
Vernal-ck	99	98	10
WL 322 HQ-check	104	104	8
Checks[5]	153	10,578	10
Test Mean	157	11,254	10
LSD .05	6	10	7
CV%[6]	4.1	6.7	7

Seed year 1998, production year, 1999.

	Minnesota		Wisconsin	
Variety	RFV[2]	Milk/Acre[3]	RFV	Milk/Acre[4]
53Q60	100	98	107	114
53V63	102	99	105	111
Baralfa 32 IQ	100	103	105	98
Breakout	103	**106**	107	116
DK 124	**102**	108	**109**	115
DK 134	105	109	103	102
DK 140	99	101	102	103
FQ 314	104	113	106	**123**
Geneva	**106**	**114**	102	107
GH 757	97	103	102	106
Spur	103	109	–	–
WinterKing	101	104	105	**110**
Vernal-ck	96	94	**101**	96
WL 322 HQ-ck	104	107	99	104
Checks[5]	137	8,202	182	10,182
Test Mean	139	8,580	189	11,071
LSD .05	5	9	8	13
CV%[6]	3.6	6.0	5.5	8.2

Seed year 1999, production year, 1999.

	Minnesota		Wisconsin	
Variety	RFV[2]	Milk/Acre[3]	RFV	Milk/Acre[4]
53Q60	108	113	99	98
9429	106	111	107	114
Colombia 2000	**101**	109	98	101
DK 124	**111**	116	102	107
DK 134	103	113	106	108
DK 140	109	114	**101**	102
Geneva	106	**120**	102	123
WinterGold	107	116	**110**	**126**
Cimarron VR-ck	97	101	–	–
Vernal-ck	97	92	101	102
WL 322 HQ-ck	106	**108**	99	97
Checks[5]	155	2,387	210	5,936
Test Mean	162	2,643	214	6,391
LSD .05	12	19	10	14
CV%[6]	8.2	11.7	6.9	9.0

Bold indicates the range: highest value, and lowest value not significantly different from highest.

[1] Varieties listed include joint Minnesota - Wisconsin quality trials (Seed Years 1995-1999), plus varieties from prior Minn. quality trials that are currently marketed in Minnesota.

[2] RFV = Relative Feed Value index (calculated from NDF and ADF)

[3] Milk per acre is calculated using season average quality and season average yield at Rosemount

[4] Milk per acre is calculated using season average quality and season average yield at Arlington, Wis.

[5] Checks: Vernal used until 1994; Vernal and WL322HQ for 1995-99 seed years

[6] CV = Coefficient of Variation. Smaller number indicates less variation between replicates.

Disease Resistance and Fall Dormancy of alfalfa varieties marketed in Minnesota.

Variety[1]	Developer or Marketer[2]	Seed Source[3]	Fall Dormancy[4]	Disease Resistance Ratings[5,6]					
				BW	VW	FW	An	PRR	Aph
2555ML	Garst Seed	30	2	HR	R	HR	HR	HR	R
329 (Max)	AgriBioTech	41	3	HR	HR	HR	HR	HR	R
3452ML	Garst Seed	30	3	HR	R	HR	HR	HR	R
5312	Pioneer Hi-Bred Int'l	55	3	HR	HR	HR	HR	HR	R
5347LH	Pioneer Hi-Bred Int'l	55	3	HR	R	HR	HR	HR	R
53Q60	Pioneer Hi-Bred Int'l	55	3	HR	R	R	HR	HR	R
53V08	Pioneer Hi-Bred Int'l	55	3	HR	HR	HR	HR	HR	LR
53V63	Pioneer Hi-Bred Int'l	55	3d	HR	HR	HR	HR	HR	HR
5454	Pioneer Hi-Bred Int'l	55	4	R	MR	HR	HR	HR	LR
620	Garst Seed	30, 36	2	HR	R	HR	HR	HR	R
630	Garst Seed	30	4	HR	MR	R	MR	R	–
631	Garst Seed	30	4	HR	R	HR	R	HR	MR
6310	Garst Seed	30	3	HR	R	HR	HR	HR	R
6410	Garst Seed	30	4	HR	HR	HR	HR	HR	HR
6420	Garst Seed	30	4	HR	R	HR	R	HR	R
8498	Mallard Seeds	45	3d	HR	R	HR	HR	HR	R
9326	LG Seeds	44	3	HR	R	HR	R	HR	R
9429	LG Seeds	44	4	HR	R	HR	HR	HR	HR
A-295	PGI / MBS	54	2	HR	R	HR	R	HR	R
A-395	PGI/MBS	54	3	HR	R	HR	HR	HR	R
Abound	Asgrow Seed	15	3	HR	HR	HR	HR	HR	HR
ABT 205	AgriBioTech	2, 3, 4	2	HR	R	HR	R	HR	R
ABT 227LH	AgriBioTech	2, 3, 4	2	HR	R	R	HR	HR	R
ABT 350	AgriBioTech	2, 3, 4	3	HR	HR	HR	HR	HR	HR
ABT 400 SCL	AgriBioTech	3, 4	4	HR	HR	HR	HR	HR	HR
ABT 405	AgriBioTech	2, 3, 4	4	HR	HR	HR	R	HR	R
Abundance	Brett-Young	18	4	HR	MR	HR	R	HR	R
Ace	W-L / UAP Seeds	0	4	HR	R	HR	HR	HR	R
Affinity+Z	America's Alfalfa	11,36,53,63,65,68	4	HR	HR	HR	HR	HR	R
Alpha 2001	Great Lakes Hybrids	35	4	HR	HR	HR	HR	HR	R
Alfagraze	America's Alfalfa	53	2	R	–	R	MR	LR	–
AlfaStar	Hoffman Seed / Sexauer	39, 60	4	HR	R	HR	HR	HR	R
AmeriGraze 401+Z	America's Alfalfa	11,36,53,63,65,68	4	HR	HR	HR	HR	HR	R
AmeriGuard 301	America's Alfalfa	0	3	HR	R	HR	HR	HR	R
AmeriGuard 302+Z	America's Alfalfa	11,36,53,63,65,68	3d	HR	HR	HR	HR	HR	HR
AmeriStand 201+Z	America's Alfalfa	11,36,53,63,65,68	2d	HR	HR	HR	R	HR	HR
Apollo Supreme	America's Alfalfa	53	4	HR	R	HR	HR	R	–
Aspen	Brown Seed Farms	19	4	HR	R	HR	HR	HR	R
Avalanche+Z	America's Alfalfa	11,36,53,63,65,68	2	HR	HR	HR	HR	HR	R
Award	Asgrow Seed	15	4	HR	HR	HR	HR	HR	R
Banquet	Tri-State Seed	28, 66	4	HR	HR	HR	HR	HR	R
Baralfa 32 IQ	Barenbrug USA	16	3	HR	R	HR	HR	HR	HR
Baralfa 54	Barenbrug USA	16	5	R	R	HR	HR	HR	–
BigHorn	Cargill Hybrid Seeds	21	4	HR	R	HR	HR	HR	HR
Blazer XL	Croplan Genetics	23	3	R	R	HR	HR	HR	R
Bountiful Plus	Tri-State Seed	66	3	HR	HR	HR	R	HR	–
Bounty	PGI/MBS	54	2	HR	R	HR	HR	HR	R
Breakout	Brunner Seed Farms	19	4	HR	R	HR	HR	HR	R
Ciba 2444	Novartis Seeds	0	3	HR	R	HR	HR	HR	R
Ciba 2888	Novartis Seeds	0	3	HR	HR	HR	HR	HR	R
Clean Sweep 1000	Agway / Allied Seed	1	3	HR	R	HR	HR	HR	R

See footnotes, page 25.

Variety[1]	Developer or Marketer[2]	Seed Source[3]	Fall Dormancy[4]	Disease Resistance Ratings[5,6]					
				BW	VW	FW	An	PRR	Aph
Columbia 2000	Allied Seed	1, 5, 10	4	R	R	R	LR	LR	S
Complete	Arrow / Fontanelle Hybrids	14, 28	3	HR	HR	HR	HR	HR	R
Crown II	Cargill Hybrid Seeds	21	3	HR	R	HR	HR	HR	–
Crystal	PGI / MBS	54	4	HR	R	HR	R	HR	LR
Cyclone	Tri-State Seed	66	3	HR	HR	HR	HR	HR	HR
Dart	AgriPro Seeds	7	3	HR	R	HR	R	HR	–
Defense+EV	AgriPro Seeds	7	3d	HR	HR	HR	HR	HR	HR
Defiant	AgriPro Seeds	7	2	HR	HR	HR	R	HR	R
Demand	AgriPro Seeds	7	3	HR	HR	HR	HR	HR	R
Depend+EV	AgriPro Seeds	7	4	HR	HR	HR	HR	HR	R
Dividend	Agway / Allied Seed	7	2	HR	R	HR	HR	HR	R
DK124	Monsanto	47	2d	HR	HR	HR	HR	HR	HR
DK127	Monsanto	0	3	HR	R	R	HR	HR	HR
DK131HG	Monsanto	47	3	HR	HR	HR	HR	HR	R
DK134	Monsanto	47	3	HR	HR	HR	HR	HR	HR
DK140	Monsanto	47	4	HR	R	HR	HR	HR	HR
DK141	Monsanto	0	4	HR	HR	HR	HR	HR	HR
DK142	Monsanto	47	4	HR	R	HR	R	HR	HR
Dominator	AgriPro Seeds	7	4	HR	R	HR	HR	HR	R
Emperor	ABI Alfalfa	0	4	HR	HR	HR	HR	HR	HR
Empire	Brunner Seed Farms	20	2	HR	R	HR	HR	HR	R
Enhancer	Rosen's / Bio-Plant Research	0	4	HR	R	HR	R	HR	MR
EverGreen	Novartis Seeds	52	3d	HR	R	HR	HR	HR	R
Evolution	Mycogen Seeds	48	2	HR	R	HR	HR	HR	R
Exceed	Specialty Seeds	62	3d	HR	R	HR	HR	HR	R
Excel	Bio-Plant Research	17	3d	HR	R	HR	R	HR	R
Extend	Spangler / Grassland West	61	4	HR	R	R	HR	HR	R
Feast+EV	AgriPro Seeds	7	3	HR	R	HR	HR	HR	R
Forecast 1000	Dairyland Seed	26	3	HR	R	HR	R	HR	R
Forecast 3000	Dairyland Seed	26	4	HR	R	HR	R	R	MR
Forerunner	Research Seed / Brown Seed	0	2	HR	HR	HR	HR	HR	R
Fortress	Novartis Seeds	52	4	R	R	R	–	HR	–
FQ 314	Cargill Hybrid Seeds	21	3	HR	HR	HR	HR	HR	HR
FQ 315	Cargill Hybrid Seeds	21	3	HR	R	HR	HR	HR	HR
FQ 302HR	Cargill Hybrid Seeds	21	3	HR	R	HR	HR	HR	R
Garst 645	Garst Seed	30	3	HR	R	R	HR	HR	MR
Garst 645 II	Garst Seed	30, 36	3d	HR	HR	HR	HR	HR	R
Gateway	Jung Seed Genetics	37	4	HR	R	HR	HR	HR	R
Geneva	Novartis Seeds	52	4	HR	HR	HR	HR	HR	HR
GH 750	Golden Harvest	32, 34	4	HR	HR	HR	HR	HR	HR
GH 755	Golden Harvest	32, 34	4	HR	R	HR	HR	HR	R
GH 757	Golden Harvest	33, 34	4	HR	HR	HR	HR	HR	HR
GH 766	Golden Harvest	32, 34	3	HR	R	HR	HR	HR	R
GH 767	Golden Harvest	33, 34	2	HR	R	HR	HR	HR	R
GH 787	Golden Harvest	33, 34	3	HR	R	R	HR	HR	R
Gold Plus	PGI / MBS	54, 64	4	HR	R	HR	HR	HR	R
Good as Gold	Johnston / Top Farm	54	4	HR	R	HR	R	HR	LR
GreenFeast	AgriBioTech	3	2d	HR	HR	HR	HR	HR	HR
GreenField	AgriBioTech	3	3	HR	R	HR	HR	HR	R
Guardian	AgVenture	9	3	HR	HR	HR	HR	HR	R
Hay Maker II	Mid-Atlantic / Kussmaul	40	4	HR	R	HR	HR	HR	R
Hunter	Ramy International	58	4	HR	R	HR	HR	HR	R

See footnotes, page 25.

Variety[1]	Developer or Marketer[2]	Seed Source[3]	Fall Dormancy[4]	Disease Resistance Ratings[5,6]					
				BW	VW	FW	An	PRR	Aph
Imperial	ABI / Top Farm Hybrids	64, 68	3	HR	R	HR	HR	HR	R
Innovator+Z	America's Alfalfa	11,36,53,63,68	3	HR	HR	HR	HR	HR	R
Interceptor	AgriPro Seeds	7	3	HR	R	HR	HR	HR	R
Iroquois	Cornell Univ.	5, 10	2	HR	S	MR	S	S	–
Jade II	NC+ Hybrids	49	4	HR	R	HR	R	HR	MR
Lactator	Elk Mound Seed	27	2	HR	HR	HR	HR	R	R
Laser	J-V / Patriot / Rainier	12	4	HR	R	HR	R	HR	MR
Legend Gold	Legend Seeds	42	3	HR	HR	HR	HR	HR	HR
LegenDairy	Croplan Genetics	23	2	HR	HR	HR	HR	HR	R
LegenDairy 2.0	Croplan Genetics	23	3	HR	R	HR	HR	HR	R
Lightning	Jung Seed Genetics	37	3	HR	R	HR	HR	HR	HR
Lightning II	Jung Seed Genetics	37	4d	HR	HR	HR	HR	HR	HR
Magnum III	Dairyland Seed	26	4	R	MR	R	MR	R	LR
Magnum III-Wet	Dairyland Seed	26	3	R	MR	R	MR	R	MR
Magnum IV	Dairyland Seed	26	4	HR	R	HR	R	HR	MR
Magnum V	Dairyland Seed	26	4d	HR	R	HR	R	HR	MR
Mainstay	AgVenture	9	3d	HR	R	HR	HR	HR	R
Mariner	Agway / Allied Seed	1, 58	2	R	MR	HR	MR	HR	MR
Maxi-Graze GT	Croplan Genetics	23	2d	HR	R	HR	R	HR	R
Maximum I	Fred Gutwein & Sons	29	3	HR	HR	HR	HR	HR	R
Milk River	R.J Hunt Seed	57	3	HR	R	HR	HR	HR	R
Monument	Geertson Seed Farm	31	3d	R	LR	R	–	MR	–
MP2000	Croplan Genetics	23	3	HR	R	HR	HR	HR	HR
Multi 5301	Geertson Seed Farm	31	4d	R	R	HR	HR	MR	–
MultiMist	Lemke Seeds	43	3	HR	R	HR	HR	HR	R
MultiQueen	Fred Gutwein & Sons	29	4	HR	R	HR	HR	HR	R
Nemesis	Renk Seed	59	3	R	HR	HR	HR	HR	HR
NetYield 500	NetSeeds	50	4d	HR	R	HR	R	HR	MR
Notice	Midwest Seed Genetics	46	3	HR	R	HR	HR	HR	R
Pasture Plus	PGI / MBS	54	3	HR	R	HR	R	HR	R
Persist	Kaltenberg Seed Farms	38	4	HR	R	HR	R	HR	MR
Platinum	Midwest Seed Genetics	46	4	HR	HR	HR	HR	HR	HR
Pointer	Dahlco Seeds	25	3	HR	R	HR	HR	HR	HR
PowerPlant	Crow's Hybrids	24	3	HR	HR	HR	R	HR	R
Pristine	Doebler's Hybrids	65	4	HR	R	HR	HR	HR	R
Proof	Mycogen Seeds	48	3	HR	R	HR	HR	HR	R
Quantum	Renk Seed	59	2	HR	HR	HR	HR	HR	R
Radiant	AMPAC Seed Co.	12	4d	HR	HR	HR	HR	HR	HR
Rainier	Novartis Seeds	52	3	HR	R	HR	HR	HR	HR
Rebound 4.2	Croplan Genetics	23	4d	HR	HR	HR	HR	HR	HR
Rhino	Geertson Seed Farm	31	3	HR	R	R	R	R	R
Rushmore	Novartis Seeds	52	4	HR	R	HR	HR	HR	HR
Rustler II	Andrews Seed	13	4	HR	HR	HR	HR	HR	R
Spirit	Fontanelle Hybrids	28, 54	3	HR	R	HR	R	HR	MR
Spredor 3	Novartis Seeds	52	1	HR	MR	HR	R	MR	S
Sprint	Specialty Seeds	62	3d	HR	R	HR	R	HR	HR
Spur	Wheatland Seed	1, 10	4	HR	R	HR	HR	HR	R
Stampede	Agway / Allied Seed	1	3	HR	R	R	–	HR	R
Sterling	Cargill Hybrid Seeds	21	2	HR	R	HR	HR	HR	R
Surpass	Andrews Seed	10, 13, 57	3	HR	R	HR	MR	R	–
Synergy	Crow's Hybrids	24	3	HR	R	HR	HR	HR	R
Target II	Bio-Plant Research	56	4	HR	R	HR	R	HR	S

See footnotes, page 25.

Variety[1]	Developer or Marketer[2]	Seed Source[3]	Fall Dormancy[4]	Disease Resistance Ratings[5,6]					
				BW	VW	FW	An	PRR	Aph
Target II Plus	Bio-Plant Research	56	3	HR	R	HR	R	HR	MR
Teton	S.Dakota Agr.Exp.Sta.	2, 5	1	LR	–	MR	S	LR	–
TMF 421	Mycogen Seeds	48	2	HR	HR	R	HR	HR	HR
TMF 4355LH	Mycogen Seeds	48	3	HR	R	HR	HR	HR	R
TMF Generation	Mycogen Seeds	48	4	HR	HR	HR	HR	HR	R
TMF Multi-plier II	Mycogen Seeds	48	3	HR	HR	HR	HR	HR	R
Trail Blazer 3.0	Croplan Genetics	23	3	HR	HR	HR	HR	HR	R
Travois	S.Dakota Agr.Exp.Sta.	2, 5	1	R	–	MR	S	S	–
UltraLac	Elk Mound Seed	27	2d	HR	HR	HR	HR	HR	HR
Value Plus	Brunner Seed Farms	19	4d	HR	HR	HR	HR	HR	HR
Vernal	USDA / Wisc.AES	2, 5, 10, 57	2	R	–	MR	–	–	–
Viking 1	Novartis Seeds	52	2	R	HR	HR	R	R	–
Vitro	North-Gro Seed	51	3	HR	HR	HR	HR	HR	R
Voyager II	Bio-Plant Research	72	4	HR	R	HR	R	HR	MR
Webfoot MPR	Great Lakes Hybrids	35	4	HR	HR	HR	HR	HR	R
WetLand	Bio-Plant Research	56, 72	3	R	MR	R	R	HR	MR
WinterGold	Renk Seed	59	4	HR	HR	HR	HR	R	HR
WinterGreen	Renk Seed	59	3	HR	HR	HR	HR	HR	R
WinterKing	Wensman Seed	69	3	HR	HR	HR	HR	HR	R
WinterStar	Wensman Seed	69	2	HR	HR	HR	HR	HR	R
WL 232 HQ	W-L Research	9, 71	2	HR	HR	HR	HR	HR	HR
WL 252 HQ	W-L Research	8, 68, 71	2	HR	R	HR	HR	HR	LR
WL 324	W-L Research	8, 68, 71	3	HR	R	HR	HR	HR	HR
WL 325 HQ	W-L Research	8, 68, 71	3	HR	R	HR	HR	HR	R
WL 326 GZ	W-L Research	8, 68, 71	4	HR	HR	HR	HR	HR	HR
WL 327	W-L Research	8, 9, 68, 71	4	HR	R	HR	HR	HR	HR
Wrangler	USDA / Nebr.AES	5, 10, 57, 70	2	R	LR	R	LR	HR	–
Grazer	Cargill Hybrid Seeds	21	2	HR	HR	HR	HR	HR	R
Yielder	AgriPro Seeds	7	3	HR	HR	HR	R	HR	R

Varieties includes those marketed in Minnesota for which disease resistance ratings were provided. Varieties which are not seeded in a recent Minnesota yield trial are excluded from yield tables, pages 12-19.

Developers list generally follows Certified Alfalfa Seed Council (CASC) 1998/99 Edition; the 1999/00 Edition was not available at the *Varietal Trials* deadline. Seed source numbers reference Forage Seed Sources Key, pages 26-27.

Fall dormancy and pest resistance ratings are as reported in CASC publication, or provided by a developer (shown as "d"), with dormancy based on fall growth in mid-October after cutting 1st week of September: 9=tallest (tend to be least winterhardy), 1=shortest.

Diseases abbreviated as BW: Bacterial Wilt, VW: Verticillium Wilt, FW: Fusarium Wilt, An: Anthracnose, PRR: Phytopthora Root Rot, Aph: Aphanomyces Root Rot. CASC Resistance Rating (% resistant plants): HR=high resistance (51 +), R=resistant (31-50), MR=moderate resistance (16-30), LR=low resistance (6-15), and S=susceptible (0-5).

Alfalfa Planting Rate and Date

Bushel Weight, Pounds 60
Seeds/Pound.....199,000
Planting Rate, Pounds/Acre 220,000
Alone 11
With Grass..... 7
Planting Rate, Seeds Sq.Ft.
Alone 55
With Grass.....32
Planting Date .....Early Spring, Late Summer

FORAGE SEED SOURCES, Key number refers to Seed Source Column in preceding table.

0 No marketer for 2000
Variety is listed to update
previous report with 1999 production year data

*1 ABT Independent Seeds
PO Box 945, Angola, IN 46703
800-813-5025

*2 ABT Independent Seeds
PO Box 84, West Hwy 212, Watertown, SD 57201
605-886-5888

*3 ABT Independent Seeds
Box 346 Savage, MN 55436
800-328-5898

*4 ABT/La Crosse Seed Co.
PO Box 187,LaCrosse, WI 54601
800-658-9428

*5 Agassiz Seed & Supply
445 7th St. NW, West Fargo, ND 58078
701-282-8118

6 AgriBioTech, Inc
120 Corporate Park Dr., Henderson, NV 89012
702-566-2440

7 AgriPro Seeds, Inc.
2369 330th St., Slater , IA 50244
800-831-6630

7 AgriPro Seeds, Inc.
8610 Pomona, Amarillo, TX 79110
806-358-4807

8 AgVenture East
Rte 2, Box 58, Kasson, MN 55944
800-657-4890

9 AgVenture Central
513 Main St, Madison Lake, MN 56063
507-243-3263

9 AgVenture West
P.O.Box 184, Jeffers, MN 56145
507-628-4929

9 AgVenture West Central
37752 880 Ave., Olivia , MN 56277
320-523-2250

9 AgVenture, Inc
207 N 7th, Kentland, IN 47951
888-999-0859

*10 Albert Lea Seedhouse
P.O Box 127, Albert Lea, MN 56007
800-352-5247

11 America's Alfalfa
12351 W.96th Terrace
Ste.101, Lenexa, KS 66215
913-599-2240

11 America's Alfalfa
P.O.Box 404, Princeton, IL 61356
800-873-2532

12 AMPAC Seed Co.
403 Wooster Rd., Winona Lake, IN 46590
219-268-9549

13 Andrews Seed Co.
580 S. Oregon, Ontario, OR 97914
541-889-9109

14 Arrow Seed
PO Box 722, Broken Bow, NE 68822
308-872-6826

15 Asgrow Seed Company
2605 East Kilgore Rd., Kalamazoo, MI 49009
616-384-5500

16 Barenbrug Midwest
1506 West 32nd. St., Vinton, IA 52349
888-470-5569

16 Barenbrug USA
P.O. Box 239, Tangent, OR 97389
800-547-4101

17 Bio Plant Research
P.O. Box 320, Camp Point, IL 62320
800-593-7708

18 Brett-Young
Box 99 St. Norbert, Winnipeg, MB R3V1L5
204-261-7932

*19 Brown Seed Farms
P.O.Box 186, Prescott, WI 54021
715-262-4331

20 Brunner Seed
W3850 U.S. Hwy 10, Durand, WI 54736
715-672-5887

21 Cargill Hybrid Seeds
PO Box 5645 MS16, Minneapolis, MN 55440
612-742-6743

*22 CEBECO International Seeds Inc.
P.O. Box 229, Halsey, OR 97348
541-369-2251

*23 Croplan Genetics
PO Box 64406, MS7455, St. Paul, MN 55164-0406
651-634-8105

24 Crow's Hybrids
PO Box 306 Hwy 1 N., Milford, IL 60953
815-889-4151

25 Dahlco Seeds
14730 15th St, Cokato, Mn 55321
320-286-5982

26 Dairyland Seed Co.
PO Box 958, West Bend, WI 53095
800-236-0163

27 Elk Mound Seed
43253 360th Ave., Sauk Centre, MN 56378
320-352-2600

27 Elk Mound Seed
PO Box 187
308 Railroad Ave, Elk Mound, WI 54739
715-879-5556

28 Fontanelle Hybrids
10981 8th St, Fontanelle, NE 68044-2505
402-721-1410

29 Fred Gutwein & Sons
25691 West 6005, Francesville, IN 47946
800-457-2700

30 Garst Seed Co.
2369 330th St., Slater, IA 50244
800-831-6630

*31 Geertson Seed Farm
1665 Burroughs Rd, Adrian, OR 97901
541-339-3768

32 Golden Harvest
Box A, 100 J.C. Robinson Blvd.
Waterloo, NE 68069
402-779-2531

33 Golden Harvest Seeds
27525 135th Ave. North, Cordova, IL 61242
309-654-2234

33 Golden Harvest Seeds
251 West Main St., Wabasha, MN 55981
612-565-2945

34 Golden Harvest, Inc.
220 N. Eldorado Rd, Ste E,
Bloomington, IL 61704
800-610-7333

35 Great Lakes Hybrids
9915 W. M-21, Ovid, MI 48866
800-257-7333

35 Great Lakes Hybrids
RR. 6 Box 6600, Mankato, MN 56001
507-625-1103

36 Interstate Payco Seed Co.
PO Box 338, West Fargo, ND 58078
701-282-7338

*37 Jung Seed Genetics, Inc.
1229 NW 41st St, Rochester, MN 55901
507-288-1930

*37 Jung Seed Genetics, Inc.
341 South High St., Randolph, WI 5395
800-242-1855

3 Kaltenberg Seed Farms
PO Box 278, Waunakee, WI 53597
800-383-3276

3 KayStar Seeds
PO Box 947, Huron, SD 57350
605-352-8791

) Kussmaul Seeds
9020 Hwy 18, Mt. Hope, WI 53816
608-988-4568

l L & H Seed
4756 West Hwy 260, Connell, WA 99326
509-234-4443

2 Legend Seeds
PO Box 241, De Smet, SD 57231
605-854-3346

3 Lemke Seeds
10220 N. Granville Rd., Mequon, WI 53092
414-242-2647

4 LG Seeds
PO Box 216, 905 Dexter St., Prescott, WI 54021
800-637-2887

5 Mallard Seed
PO Box 637, Plainview, MN 55964
507-534-2300

5 Midwest Seed Genetics
PO Box 518, 23751 Hwy 30 E., Carroll, IA 51401
800-369-8218

7 Monsanto
3100 Sycamore Road., De Kalb, IL 60115
815-758-9323

3 Mycogen Seeds
1340 Corporate Center Curve
Eagan, MN 55121-1233
651-405-5973

3 NC+ Hybrids
Box 4408, Lincoln, NE 68504
402-467-2517

) NetSeeds
9001 Hickman Rd.
Ste.320 Urbandale, IA 50322
515-331-0939

l North-Gro Seeds
613 N. Randolph St., Cuba City, WI 53807
608-744-7333

2 Novartis Seeds
PO Box 959, Minneapolis, MN 55440
612-593-7286

i3 Olds Seed Co.
2901 Packers Ave., Madison, WI 53704
800-356-7333

l PGI / MBS Inc.
225 West 1st St., Story City, IA 50248
800-247-3967

55 Pioneer Hi-Bred International, Inc.
130 Willmar Ave. SE, Willmar, MN 56201
612-235-7420

56 Producers Hybrids, Inc.
PO Box C, Battle Creek, NE 68715
888-675-3190

56 Producers Hybrids, Inc.
22899 696th Ave., Dassel, MN 55325
320-275-3693

*57 R.J. Hunt Seed Co.
13477 Co Rd 101, Wadena, MN 56482
218-631-4190

58 Ramy International Ltd.
1329 N. River Front Drive, Mankato, MN 56001
800-658-7269

59 Renk Seed Company
6800 Wilburn Rd., Sun Prairie, WI 53590
800-289-7365

60 Shepherd Seeds
RR 1 535 Middle Road, South Beloit, IL 61080
800-383-2676

61 Spangler Seeds
803 W. Racine St., Jefferson, WI 53549
414-674-4606

*62 Specialty Seeds
26787 Hillhaven Drive, Cold Spring, MN 56320
800-685-4521

63 Terning Seeds, Inc.
15365 60th St. SW, Cokato, MN 55321
320-286-2168

*64 Top Farm Hybrids
13506 U.S. Hwy 12 SW, Cokato, MN 55321
320-286-5516

*65 Trelay, Inc.
11623 Hwy 80 N, Livingston, WI 53554
800-421-0397

66 Tri-State Seed
28401 GoldenGate Rd., Sleepy Eye, MN 56085
800-203-8581

*67 Twin Cities Seeds
7265 Washington Ave South, Edina, MN 55439
800-545-8873

68 UAP Midwest
PO Box 55, Kasota, MN 56050
800-722-2274

69 Wensman Seed Co.
PO Box 190, Wadena, MN 56482
218-631-2954

*70 Werner Farm Seeds
3104 Millersburg Blvd., Dundas, MN 55019
507-645-7995

71 W-L Alfalfas
1077 Shawmut St. South, Shakopee, MN 55379
612-308-9273

71 W-L Research, Inc.
8701 W U.S. Hwy 14, Evansville, WI 53536
608-882-4100

72 Ziller Seed Co., Inc.
76374 380th St., Bird Island, MN 55310
320-365-3674

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* These sources are useful contacts for public alfalfas (2,5,70) and several other forages species, such as
Red clover (1,2,3,4,5,10,19,22,23,37,53,57,62,67,70)
Birdsfoot trefoil (3,4,5,10,22,23,53,57,65,67,70)
Kura clover (2,3,4,10,23,53,70)
Reed canarygrass (2,3,4,5,10,23,35,53,57,64,70)
Smooth bromegrass (2,3,5,10,23,53
Orchardgrass (2,3,4,5,10,22,23,37,53,57,64,70)
Timothy (2,3,4,5,19,22,23,53,57,64,65,67,)
Tall fescue (3,4,10,22,23,53,65,67,70).

BIRDSFOOT TREFOIL

Birdsfoot trefoil, an excellent nonbloating pasture legume, can also be harvested for hay and silage. It grows under a wide range of soil conditions, and persists longer and performs better than other legumes under poor soil conditions such as low fertility, acidity and poor drainage. It is also persistent when grown with Kentucky bluegrass, reed canarygrass and timothy.

Performance trials of birdsfoot trefoil were established at Rosemount in 1994,1998 and 1999 and in Grand Rapids in 1994 and 1998. The trials were harvested twice at Grand Rapids and three times at Rosemount except in 1999 when Rosemount was only harvested twice as well.

Roseau and Nueltin,two varieties that have increased natural tolerance to the herbicide Roundup, will be on the market soon. Steadfast, a rhizomatous birdsfoot trefoil released in Missouri, was significantly lower yielding than other varieties in the trial and may not be winter hardy enough to be grown in Minnesota.

Winterhardy varieties such as Norcen produced the highest overall yields.

Norcen, released in 1983 by the agricultural experiment stations of Minnesota and six other states, has performed exceptionally well in grazing trials.

Birdsfoot Trefoil Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound	372,000
Planting Rate, Pounds/Acre	
Alone	8
In Mixtures	6
Planting Rate, Seeds Sq.Ft.	
Alone	70
In Mixtures	50
Planting Date	Early Spring or Summer

BROMEGRASS

Bromegrass is generally grown for hay in mixture with alfalfa, or is used as pasture in mixture with other grasses and legumes. Varieties can be classed as southern, intermediate or northern types. Varieties of the southern type may not be higher yielding, but are generally less susceptible to leaf diseases and earlier in maturity than northern types. All varieties are winter-hardy. Some stand losses may occur when bromegrass is managed under three- and four-cut alfalfa harvest systems.

Varieties are currently being evaluated in pure stands at Minnesota experiment stations. Nitrogen was applied at all locations in early spring and after harvest at a rate of 40 to 50 pounds per acre. Average dry matter yields were very high in 1998-99 and few differences were found between performance of the varieties. Stand losses on all entries included in the table were noted in Rosemount after the first harvest in 1999 except for the variety York.

Dry matter yield, tons dry matter per acre, of smooth bromegrass seeded at two locations, 1998.

	Rosemount 1998-99	Morris 1998
Variety		
Alpha	5.8	3.2
Badger	5.4	3.0
Bounty	5.5	3.2
Lincoln[1]	5.3	–
York	5.7	3.4
LSD 5%	0.4	NS

[1] The Lincoln seedlot has low germination which resulted in poor stand establishment.

Dry matter yield, tons dry matter per acre, or birdsfoot trefoil varieties seeded at Grand Rapids and Rosemount.

	Rosemount			Grand Rapids	
	19951-96	1998	1999	1995-96	1999
Variety					
Bright	–	3.6	3.9	–	–
Dawn	–	4.0	3.7	–	4.9
Empire	3.6	4.0	–	2.2	4.9
Fergus	–	3.9	–	–	–
Georgia 1	–	–	3.4	–	4.5
Leo	3.5	3.9	3.6	2.3	
Norcen	3.6	4.3	3.7	2.2	4.7
Nueltin	3.3	3.7	3.8	–	4.7
Roseau	3.4	4.1	3.5	–	4.7
Steadfast	–	3.1	1.9	–	3.7
Trevig	–	4.1	–	–	–
Viking	3.8	3.8	3.9	2.2	4.5
WIT	3.5	4	3.7		
LSD 5%	NS	0.5	0.4	0.2	0.3

Bromegrass Planting Rate and Date

Bushel Weight, Pounds	14
Seeds/Pound	136,000
Planting Rate, Pounds/Acre	
Alone	16
In Mixtures	5
Planting Rate, Seeds Sq.Ft.	
Alone	50
In Mixtures	15
Planting Date	Early Spring or Late Summer

CICER MILKVETCH

Cicer milkvetch is a vigorous, persistent, high-yielding perennial legume that spreads by rhizomes. Stands can persist for many years under heavy grazing and, once established, can tolerate stress well. It tolerates drought and is grown extensively for grazing in the western United States. It is also very winter hardy and resistant to insects and diseases.

Cicer milkvetch has poor seedling vigor and may take 2 years to adequately establish.

Although forage quality of cicer milkvetch is high, it also has unknown anti-quality components that can cause photosensitization and hair loss on some grazing ruminants. More evaluation is needed before widespread use of cicer milkvetch is recommended for grazing in Minnesota.

Forage trials were established at all locations in 1998 and were harvested twice in 1999.

Dry matter yield, tons dry matter per acre, of cicer milkvetch varieties seeded at three locations.

	Grand Rapids 1999	Rosemount 1999	Morris 1999
Variety			
Hi Pal	5.1	3.5	2.3
Lutana	4.4	3.5	2.2
Monarch	4.4	3.3	2.3
Windsor	4.5	3.1	2.3
LSD 5%	0.6	0.4	NS

Cicer Milkvetch Planting Rate and Date

Bushel Weight, Pounds 60
Seeds/Pound.....120,000
Planting Rate, Pounds/Acre
Alone 16
Planting Rate, Seeds Sq.Ft.
Alone 50
Planting Date.....Early Spring or Summer

ORCHARDGRASS

Orchardgrass is often used in hay and pasture mixes with other grasses and legumes because it establishes rapidly and recovers quickly after grazing or harvesting. Its major limitation is a lack of winterhardiness, but it can persist and remain productive in areas with reliable snow cover.

Orchardgrass varieties were established in pure stands in 1998 at Rosemount and Grand Rapids and in 1997 at Rosemount and Morris.

Experimental plots were generally harvested three times per year. The Morris location was harvested only twice in 1999. Nitrogen was applied in the early spring and after each harvest at rate of 50 pounds per acre.

Orchardgrass Planting Rate and Date

Bushel Weight, Pounds 14
Seeds/Pound.....653,000
Planting Rate, Pounds/Acre
Alone 10
In Mixtures.....3
Planting Rate, Seeds Sq.Ft.
Alone 150
In Mixtures.....45
Planting Date
Alone.....Early Spring or Late Summer
In Mixtures .....Use Date for Legume

Dry matter yield, tons dry matter per acre, of orchardgrass varieties seeded at three locations.

	Grand Rapids		Rosemount		Morris
	1990-1994	1999	1998-99	1999	1998-99
Variety					
AC Nordic	–	5.7	–	4.3	–
Albert	–	5.5	–	–	–
Ambassador	3.5	5.8	4.4	–	2.4
Bengal	–	–	–	4.4	–
Condor	–	6.2	4.6	–	2.3
Crown	3.5	–	4.3	–	2.4
Dawn	3.6	–	–	–	–
Duke	–	5.9	5.0	4.3	2.5
Elsie	3.5	6.3	–	3.8	–
Haymate	–	5.9	4.6	–	2.6
Hawkeye	–	6	–	4.3	–
Justus	3.4	5.4	4.5	4.2	2.6
Megabite	–	5.9	–	4.4	–
Mammoth	–	–	–	4.2	–
Napier	3.6		4.4		2.2
Orbit	3.4		3.9		2.5
Orion	3.7	6.5	4.9	4.5	2.5
Potomac	3.5		4.6	4.3	2.5
Shawnee	3.3		–		–
Sterling	3.4		–		–
Warrior				4.3	
LSD 5%	NS	0.6	0.4	0.4	0.3

RED CLOVER

Red clover can be seeded in pure stands or with cool-season grasses for hay or silage. It is more easily established in pasture renovation than either alfalfa or birdsfoot trefoil.

Historically, the winterhardy varieties of red clover have not persisted beyond two crop years in Minnesota because they are susceptible to diseases. However, most of the improved varieties currently sold for use in Minnesota can persist for three years if the weather provides good winter snow cover.

Minnesota Agricultural Experiment Station scientists established performance trials of red clover at three locations in 1995. The trials established in 1995 were harvested at Grand Rapids, Morris and Rosemount in 1996 and at Rosemount and Morris in 1997 and 1998. Severe winter injury destroyed the trial at Grand Rapids. Another trial was established at Grand Rapids in 1998 and harvested in 1999.

Varietal differences for forage yield were small at all locations except for Astred which does not seem to be winterhardy enough to survive reliably in Minnesota. Some of the newer varieties yield somewhat better in the third production year because they have been bred for better persistence.

Dry matter yield of red clover, tons dry matter per acre, seeded at three locations, 1995.

	Grand Rapids		Rosemount		Morris			
	1996	1999	1997	1998	1996	1997	1998	Mean
Variety								
Arlington	3.1	3.3	3.3	4.8	3.2	2.0	2.9	3.2
Astred	2.4	–	2.2	3.3	2.5	1.8	2.7	2.4
Cinnamon	3.4	–	3.7	5.3	3.4	2.1	3.0	3.4
Marathon	3.2	4.0	3.5	4.5	3.4	1.7	2.6	3.3
Prima	–	3.8	–	–	–	–	–	–
Randolph	3.4	3.8	3.5	4.7	3.8	2.0	2.8	3.5
Redland III	–	–	–	–	3.3	1.9	2.8	–
Scarlett	3.3	3.9	3.5	4.8	3.7	1.8	2.8	3.4
LSD 5%	0.5	0.4	0.5	0.8	NS	0.3	NS	0.4

Red Clover Planting Rate and Date

Bushel Weight, Pounds 60
Seeds/Pound 272,000
Planting Rate, Pounds/Acre
- Alone 9
- In Mixtures 5

Planting Rate, Seeds Sq.Ft.
- Alone 50
- In Mixtures 30

Planting Date
- Alone ..... Early Spring to September 1
- In Mixture ..... Use Date for Legume

REED CANARYGRASS

Reed canarygrass is adapted throughout Minnesota for use as hay, pasture and silage. It is one of the best grass species for poorly drained soils and tolerates flooding better than other cool-season grasses. The species utilizes nitrogen efficiently and is adapted to liquid manure application. However, seedling vigor of reed canarygrass is not as good as other commonly used forage grasses.

Prior to 1985 common reed canarygrass had been described as being less palatable than most other grass species seeded for hay and pasture. Cattle produced well on the grass only if it was grazed when it was between 6 and 24 inches tall.

The most recent developments in reed canarygrass breeding have been the release of varieties low in indole alkaloid concentration. This dramatically improves animal performance and palatability. Alkaloids are bitter, complex, nitrogen-containing compounds.

In grazing trials, lambs and steers gained more weight and sheep had less diarrhea on low-alkaloid varieties than on common reed canarygrass. Hay should be harvested between the boot and early-heading stage because quality declines with maturity.

Trials were established in pure stands in 1989 at Morris and Rosemount. The trial was harvested twice at Morris and three times at Rosemount in 1990, 1991 and 1992. Trials were also established in 1993 at Morris, Grand Rapids and Rosemount, and these trials were harvested twice at Grand Rapids and Rosemount in 1994 and three times at Morris.

In 1995 and 1996, the trials were harvested three times per year. Nitrogen was applied early in the spring and after each harvest at a rate of 40 to 50 pounds per acre.

Dry matter yield, tons dry matter per acre, of reed canarygrass at three locations in Minnesota.

	Grand Rapids	Rosemount		Morris		
	1990-1994	1999	1998-99	1999	1998-99	
Variety						
Lara	–		–	3.0	–	–
Palaton	3.5		6.9	3.1	3.8	6.1
Rise	–		6.2	–	4.0	–
Vantage	3.3		6.3	3.3	4.0	5.7
Venture	3.5		7.1	3.1	4.3	5.5
LSD 5%	NS		0.8	NS	NS	NS

Reed Canarygrass, continued

Each of the available varieties is winter-hardy and persistent in Minnesota. High-yielding, low alkaloid varieties Palaton and Venture are currently marketed here.

Reed Canarygrass Planting Rate and Date

Bushel Weight, Pounds	46
Seeds/Pound	526,000
Planting Rate, Pounds/Acre	
Alone	7
In Mixtures	5
Planting Rate, Seeds Sq.Ft.	
Alone	85
In Mixtures	60
Planting Date	
Alone	Early Spring or Late Summer
With Legumes	Use Date for Legume

TALL FESCUE

Tall fescue, a bunchgrass, may be planted in mixtures with other grasses and legumes. It establishes rapidly, withstands trampling, tolerates summer drought and produces fall season pasture when other grasses become dormant. Tall fescue is subject to winter injury, but it may remain productive in areas with reliable snow cover.

Animal performance is better when the variety grown is endophyte-free. Endophytes are fungi that invade plant tissues, reducing forage palatability and animal performance.

The wheatgrasses are valuable, native forage species. They are especially suitable for growing in the northern Great Plains area of the United States. Wheatgrasses can produce excellent forage yields and sustained productivity under hay and pasture management systems either in monoculture or in mixtures with alfalfa or other suitable legumes. Recent releases of improved varieties have prompted interest in these species, especially in western areas of Minnesota.

Minnesota Agricultural Experiment Station scientists initiated performance trials of tall fescue and the wheatgrasses in 1992 and 1997. The trials were harvested three times per year, and nitrogen was applied in the early spring and after each harvest at rates of 50 pounds per acre.

Yields have been generally good except at Rosemount in 1995 when plots suffered severe winter injury. The wheatgrasses and fescue x ryegrass hybrids did yielded less forage than the tall fescue varieties. The wheatgrasses are better adapted to environments drier than the previous growing seasons. The fescue x ryegrass hybrids are more susceptible to winter injury.

Tall Fescue Planting Rate and Date

Bushel Weight, Pounds	25
Seeds/Pound	229,000
Planting Rate, Pounds/Acre	
Alone	10
In Mixtures	4
Planting Rate, Seeds Sq.Ft.	
Alone	50
In Mixtures	20
Planting Date	
Alone	Early Spring or Summer
With Legumes	Use Date for Legume

Dry matter yield, tons dry matter per acre, of tall fescue, wheatgrass and festuca-lolium hybrids seeded at three locations.

	Grand Rapids		Rosemount		Morris
Variety	1994-96	1999	1993-95	1998-99	1993-1996
Tall Fescue					
Barcel	3.0		5.3	–	4.5
Cajun	–	6.9	–	5.6	–
Fawn	3.3		4.9	–	5.0
Ky 31-endophyte infected[1]	3.5	7.1	5.8	–	4.7
Ky 31-endophyte free[1]	3.3		5.6	6.5	4.9
Martin	3.6	6.8	5.3	5.1	4.7
Maximize	–	7.1	–	5.2	–
Mozark	3.5	6.7	5.4	5.8	4.8
Mustang	2.7	6.6	4.7	5.4	–
Seine	–		–	6	4.8
Stef	3.3		5.3	–	–
Festuca-Lolium Hybrids					
Kemal	–	6.0	–	3.7	–
Tandem II		6.2		3.4	
Wheatgrasses					
Manska	2.9		4.0	–	4.8
Newhy	2.7		3.9[2]	4.6	–
Reliant	3		4.2	–	5.0
LSD 5%	0.5	0.8	0.6	0.5	NS

[1] Endophytes are fungi that invade plant tissues, reducing forage palatability and animal performance.

[2] Newhy main yield reported for 1993 and 1994. Winter injury was severe at Rosemount in 1994-1995 resulting in stand loss of Newhy and reducing overall varietal yield by 25%

TIMOTHY

Timothy is adapted throughout Minnesota for use in hay and pasture mixes. When timothy is the major component in hay, its stage of maturity affects both yield and quality. Harvesting timothy at early heading is the preferred time. Timothy produces the majority of it's forage at the first harvest.

Varieties of timothy differ in maturity so care should be taken in choosing ones that fit the management requirements of the crop and mixture. Early varieties are best adapted to a three-cut system with alfalfa.

Intermediate to late-maturing varieties should not be harvested more than twice during the growing season. Appropriately selected timothy varieties are compatible with red clover and birdsfoot trefoil in mixtures for hay production.

Varieties in the experiment station timothy trials were established in pure stands in 1992 at Rosemount and Morris and again at Grand Rapids in 1993. Nitrogen was applied at all locations in the early spring and after each harvest at a rate of 40 to 50 pounds per acre.

Early-maturing varieties of timothy had greater forage production than the late maturing varieties at all locations over all harvest years. At Morris and Rosemount the yields of timothy were exceptionally high in 1993 and 1994. These results may be partially attributed to mild winters, and abundant rainfall and cool temperatures during the growing seasons. Timothy is normally less persistent than other cool-season grasses, such as reed canarygrass.

Timothy Planting Rate and Date

Bushel Weight, Pounds 45
Seeds/Pound.....1,234,000
Planting Rate, Pounds/Acre
In Mixtures.....3
Planting Rate, Seeds Sq.Ft.
In Mixtures.....85
Planting Date
In Mixtures.....Use Date for Legume

Dry matter yield, tons dry matter per acre, of timothy seeded at three locations.

Variety	Grand Rapids 1994-96	Rosemount 1993-1995	Morris 1993-1996	Mean
Early-Intermediate maturity:				
Climax	3.6	3.8	4.0	3.8
Comtal	3.4	3.7	–	3.6
Goliath	3.4	3.4	–	3.4
Timfor	3.5	3.8	–	3.7
Toro	3.7	3.9	–	3.8
Late maturity:				
Heidemij	3.5	3.0	3.5	3.3
Hokusen	3.3	3.4	3.6	3.4
LSD 5%	0.4	0.4	NS	

Minnesota Approved Seed Conditioners and Marketing Association

The Minnesota Agricultural Experiment Station appreciates the Minnesota Approved Seed Conditioners and Marketing Association's (MASCMA) generous financial contribution toward publication of this edition of *Varietal Trials of Farm Crops.*

Member plants of this association are identified by the symbol shown. In addition to being approved for conditioning certified seed by the Minnesota Crop Improvement Association (MCIA) they voluntarily maintain membership in MASCMA to promote professionalism in seed conditioning and distribution. These plants play a significant role in distributing seed of varieties developed by the Agricultural Experiment Station and in enhancing the quality of seed planted in the state. They are designed specifically for the proper conditioning of seed, are properly built and equipped, meet specific seed-handling standards, and are inspected at least annually by MCIA to assure that all requirements for approved plant status are met. They are a wise choice for quality seed conditioning services.

Adams Seed	Wendell	218-458-2151
Albert Lea Seed House	Albert Lea	507-373-3161
Angell Seed Farm	Blooming Prairie	507-583-7581
Backman Seeds	Herman	320-677-2231
Behm Seed Company	Atwater	320-974-3003
Beyer Seed Farm	Kent	218-643-5126
Bloomquist Farms	Drayton, N.D.	218-455-3863
Borg Seed Farms	Cokato	320-286-2222
Buer's Seeds	Canby	507-223-5100
Bursch Seed Company	Mahnomen	218-935-2772
Busch Agricultural Resources	Moorhead	218-236-7472
Busse Seeds	Appleton	320-394-2315
Byron Farm Store	Waseca	507-835-1120
Capistran Seed Company	Crookston	218-281-7840
Circle C Seeds	Gary	218-356-8214
Clearwater Valley Seeds	Gully	218-628-4171
Clinton Ag Service	Clinton	320-325-5203
Corning Seed & Supply	Austin	507-433-9002
Crop Production Services	Perham	218-346-2355
Dahlco Seeds	Cokato	320-286-5982
Dahlman Seed Company	Dassel	320-275-2527
Dammann Seed Farms	Plato	320-864-3004
Enestvedt Brothers	Sacred Heart	320-765-2728
Falk Seed Farm	Murdock	320-875-4341
Farmers Co-op Grain & Seed	Thief River Falls	218-681-6281
Galler Seeds	Elysian	507-267-4328
Haas Seed Farm	Le Sueur	507-665-3683
Haberer Seed Farm	Morris	320-795-2468
Habstritt Farms	Roseau	218-463-1193
Hapka Seed Farm	Argyle	218-437-6603
Haugrud Seed Plant	Rothsay	218-493-4275
Heartland Seeds	Moorhead	218-585-4621
Hermanson Seed Plant	Boyd	320-855-2527
Farmers Cooperative Assn.	Jackson	507-847-4160
Jensen Seed Company	Stephen	218-478-3397
Johnson Seeds of Dassel	Dassel	320-275-2430
JSF, Inc. (Johnson Seed Farm)	Sacred Heart	320-765-2225
Kiecker Seed Company	Hector	507-426-8167
Knapp Seed Farm	Foxhome	218-739-3366
Krabbenhoft Seed & Supply	Sabin	218-789-7219
L.B. Grain	Lake Bronson	218-754-4200
Lee Seed Farm	Borup	218-494-3330
Lee's Seed Farm	Benson	320-843-2857
Lincoln County Feed & Seed	Ivanhoe	507-694-1243
Madison Farmers Mill & Elevator	Madison	320-598-7351
Marvin's	Warroad	218-386-1333
McFarlane Seeds	Greenbush	218-782-2700
Meyer's Seed	Elgin	507-876-2482
Mid-Valley Grain Cooperative	Crookston	218-281-2881
Nietfeld Farm	Melrose	320-987-3442
Petermann Seeds	Hawley	218-483-3302
Red River Marketing Company	Elbow Lake	218-685-6100
Rivard's Quality Seeds	Argyle	218-437-6638
Ron Petersen Seeds	Lake Bronson	218-754-4631
Ross Seed Company	Fisher	218-891-2211
Rossbach Lakeside Seeds	Hanska	507-794-7698
Sawvell's Seed	Clements	507-692-2240
Schaefer Brothers	Hancock	320-392-5380
Spronk & Sons Seed Farm	Edgerton	507-442-5334
St. Hilaire Seed Company	St. Hilaire	218-964-5407
State Line Farmers Cooperative	Madison	320-598-7351
Storden Seed & Chemical Service	Storden	507-445-3217
Swenson Seed Farm	Brooks	218-796-5285
Thiel Seed Service	Wendell	218-458-2415
Tobolt Seed	Moorhead	218-287-2904
Tracy-Garvin Cooperative	Tracy	507-629-3780
McIntyre Farms	Cassleton, N.D.	701-347-5355
Watonwan Farm Service	Kiester	507-294-3697
Weinlader Seed Company	Drayton, N.D.	701-454-6427
Werner Farm Seeds	Dundas	507-645-7995
Wigen Seed Farm	Litchfield	320-693-8182
Willette Seed Farm	Delavan	507-854-3595
Wright Seed Service	West Concord	507-527-2737
Zabel Seeds	Plainview	507-534-2487
Ziller Seed Company	Bird Island	320-365-3674
Zimmerman Seeds	Racine	507-378-2077

BARLEY

Although fusarium head blight (scab) continues to impact the barley crop, toxin levels (DON) were down from previous years. Overall it was not a good year for small grains, and barley was no exception. Some growers lost their entire production due to flooding.

Recommended Public Varieties

Robust – Medium yield and medium maturity. Good lodging resistance and kernel plumpness. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Classified as a malting variety by the American Malting Barley Association (AMBA). Robust is currently the six-row variety of choice for malting and brewing in the Midwest. Resistant to spot blotch. Developed by Minn. AES from crosses involving Morex and Manker. Released 1983. PVP

Foster – Medium yield. Maturity similar to Robust. Kernel plumpness good, similar to Stander. Intermediate in lodging reaction between Robust and Stander. Resistant to spot blotch. Six-rowed, semi-smooth awns, colorless aleurone. Has long rachilla hairs allowing grain to be distinguished from that of Robust and Stander. Classified as a malting variety by AMBA. Discounted in the marketplace as compared to Robust. Developed by N. D. AES from crosses involving Robust, ND 5570, Glenn and Karl. Released 1995. PVP (94)

Stander – High yield. Superior in lodging resistance to Robust and Foster. Good kernel plumpness, similar to Robust. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Initially classified as a malting variety by AMBA, but has been removed from the industry approved list. Resistant to spot blotch. Developed by Minn. AES from crosses involving Excel, Robust and Bumper. Released 1993. PVP

MNBrite – Provides some protection against Fusarium head blight (scab). It has about one-half as many infected kernels per head as Robust and Stander and its toxin level (DON) is also about one-half of Robust and Stander. The kernels are brighter and more disease-free than for other varieties, hence the name MNBrite. It is similar to Robust in yield, maturity, and kernel plumpness, as well as lodging reaction. Resistant to spot blotch. Malting and brewing quality not acceptable to industry. MNBrite is higher than Robust in grain protein. Six-rowed, semi-smooth awns, colorless aleurone. Grain samples difficult to distinguish from Robust and Stander. Developed by Minn. AES. Released 1998. PVP (pending)

Special Purpose Variety

Royal – Intended for use as a forage companion crop and feed-grain variety. Not a malting type. Six-rowed, semi-smooth awn, blue aleurone, semidwarf stature. Forage quality superior to taller varieties based on digestibility and intake potential; low in fiber and lignin. Similar to Robust in forage protein and forage yield at the soft dough stage. Compared to taller barley and oat varieties, Royal competes less with underseeded forage legumes because of its short stature and superior lodging resistance. Resistant to spot blotch. Developed by Minn. AES from crosses involving Robust, Azure and semidwarf Minn. M32. Released 1994. PVP (94)

Grain yield of selected barley varieties in bushels per acre, 1996-1999.

	Crookston	Morris	Stephen	St.Paul	Roseau	**Mean**
Number of trials	9	7	2	5	2	**25**
Variety						
Robust	99	98	102	76	81	**93**
Stander	117	106	107	87	87	**105**
Foster	109	104	100	87	79	**100**
MNBrite	105	103	104	81	83	**98**
LSD 0.05	5	6	10	5	8	**3**

Other Varieties

Excel – High yield. Medium maturity. Similar to Robust in lodging resistance. Kernel plumpness lower than Robust. Six-rowed semi-smooth awn, colorless aleurone. Has long rachilla hairs, allowing grain to be distinguished from that of Robust and Stander. Classified as a malting variety by AMBA. Resistant to spot blotch. Developed by Minn. AES from cross involving Robust, Manker and a sister-line of Morex. Released 1990. PVP

Morex – Low yield. Susceptible to lodging. Kernel plumpness intermediate. Six-rowed, semi-smooth awn, short rachilla hairs, colorless aleurone. Awns may drop off as crop approaches maturity. Threshes easily. Classified as a malting variety by AMBA. Moderate resistance to spot blotch. Developed by Minn. AES from cross of Cree and Bonanza. Released 1978.

Barley Planting Rate and Date

Bushel Weight, Pounds	48
Seeds/Pound	14,300
Planting Rate, Pounds/Acre	85
Planting Rate, Seeds Sq.Ft.	28
Planting Date	Early Spring

Agronomic traits of selected barley varieties, 1996-1999.

	Heading Date	Height, In.	Lodging, %	Plump, %
Number of trials	17	18	11	9
Variety				
Robust	6-22	35	38	77
Foster	6-22	35	40	78
MNBrite	6-23	35	38	77
Stander	6-24	33	32	80

Scab severity, percent infected kernels/spike in selected barley varieties, 1996-1999.

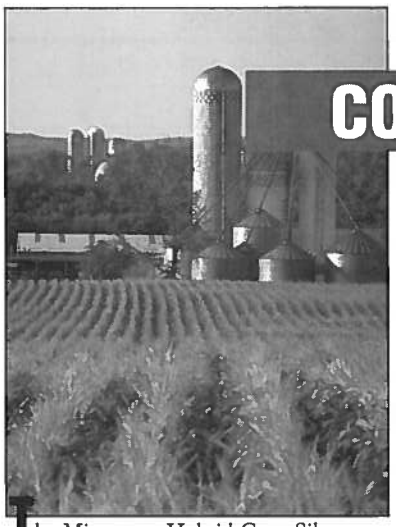
	Inoculated and Misted Trials	Non-Inoculated (Natural Infection)		
		Langdon, N.D.	Crookston	Crookston (1999)
Number of trials	9	2[1]	3[2]	2
Variety				
Robust	27	15	10	2
Stander	40	15	11	4
Foster	–	15	–	–
MNBrite	14	6	5	1

[1] Trials conducted in 1998. [2] Trials conducted in 1996-1998.

Toxin (DON, ppm) values in grain from non-inoculated (naturally infected) trials for selected barley varieties, 1996-98.

	1996[1]	1997[1]	1998[2]
Variety			
Robust	3.6	3.4	4.7
Stander	5.8	7.3	6.6
Foster	–	3.4	5.5
MNBrite	2.8	2.6	4.0

[1] Crookston and Stephen, advanced yield trials. [2] Dr. Jochum Wiersma, Minnesota on-farm yield trials.



CORN Silage

The Minnesota Hybrid Corn Silage Evaluation Program was initiated to evaluate corn hybrids intended for use as silage and provide unbiased forage yield and quality information. The program is financed in part by entry fees from private seed companies that enter hybrids for testing.

Test Sites

The 1999 trials were conducted at Rosemount and Waseca. Locations and maturities are categorized as follows:

Southern Zone: Waseca

Early maturity group – Hybrids rated 105 day Relative Maturity (RM) and earlier.

Late maturity group – Hybrids rated later than 105 day RM.

Central Zone: Rosemount

Early maturity group – Hybrids rated earlier than 100 day RM.

Late maturity group – Hybrids rated 100 day RM or later.

Test Procedure

Design: Plots were established at Waseca and Rosemount in randomized block designs with four replications. Hybrids were planted at a 33,000-seeds-per-acre seeding rate with 30-inch row spacing. Standard check hybrids were included to represent the RM groups at each location.

Harvesting: Plots were harvested and herbage sampled for yield and forage quality determination for each RM group. The target maturity was whole-plant moisture content of 60% to 65%. Harvest at Waseca was on September 10 for the Early RM group and September 16 for the Late RM group. Harvest at Rosemount was on September 9 for the Early RM group and September 17 for the Late RM group. After grain maturation, two rows adjacent to those sampled for silage were harvested for grain and yields adjusted to 15.5% moisture.

Test Results

Whole-plant dry matter yields (DM), silage yields, moisture content, grain yields taken after physiological maturity, and crude protein (CP), acid detergent fiber (ADF), neutral detergent fiber (NDF), and in vitro digestive dry matter (IVDDM) concentrations are given for entries in each RM group. Means and least significant difference (LSD) statistical figures are given for each RM group and averaged across locations. Hybrids are ranked by average moisture content, they differ in dry matter, silage and grain yields. ADF and NDF are negative indicators of forage digestibility and intake respectively. Lower ADF and NDF numbers are related to better animal performance. IVDDM is a laboratory test to estimate digestibility in ruminant livestock.

Moisture, yield and quality traits for Early relative maturity corn hybrids at Waseca, 1999.

		Yield [1]				Concentration, Percent [2]			
Brand	Hybrid	Moisture, Percent	Grain, bu/a	DM, ton/a	Silage, ton/a	CP	ADF	NDF	IVDDM
DahIco	DS 348wx	52.4	162	8.8	18.6	6.7	26	44	68
Mycogen	TMF100	55.0	183	10.5	23.3	6.3	25	43	69
Wensman	W5378Bt	59.6	160	9.0	22.2	6.1	23	37	73
Dairyland	Stealth 1406	59.7	171	9.0	22.4	6.3	25	42	70
DahIco	DS 5101wx	60.0	165	8.5	21.3	6.8	23	38	72
Trelay	7004	60.1	166	9.3	23.3	6.7	23	38	73
Trelay	SP692	60.6	193	10.1	25.5	6.6	23	39	72
DahIco	DS 8051	60.8	204	9.9	25.2	6.9	24	41	72
Dairyland	Stealth 1507	62.3	173	10.0	26.5	6.6	23	39	73
Dairyland	Stealth 1508	62.6	181	9.8	26.2	6.2	24	41	71
Early RM Averages		59.3	176	9.5	23.4	6.5	24	40	71
LSD (0.05)		4.2	22	1.0	2.2	NS	2	4	3

[1] DM yield is whole-plant yield at 100% dry matter. Silage yield is whole-plant yield at harvest moisture. Grain harvested Oct. 12, 1999, and adjusted to 15.5% moisture. [2] See "Test Results" text for description of concentration items.

Moisture, yield and quality traits for Late relative maturity corn hybrids at Waseca, 1999.

		Yield[1]				Concentration, Percent[2]			
Brand	Hybrid	Moisture, Percent	Grain, bu/a	DM, ton/a	Silage, ton/a	CP	ADF	NDF	IVDDM
Pioneer	35R57	57.1	203	10.9	25.4	6.5	23	39	71
Wensman	W5359Bt	59.6	186	9.1	22.6	7.1	24	40	70
Golden Harvest	H-2515	60.7	173	10.7	27.2	6.7	21	35	74
Epley	E2480	60.7	190	10.7	27.2	6.9	23	39	73
Epley	E499	60.9	188	9.8	25.0	6.4	23	39	73
Cargill	6481FQ	64.0	175	9.3	25.8	7.1	22	37	73
Garst	24X	64.6	189	10.0	28.2	7.0	25	42	70
Late RM Averages		61.1	186	10.1	25.9	6.8	23	39	72
LSD (0.05)		2.8	ns	1.0	2.4	ns	ns	4	3

[1] DM yield is whole-plant yield at 100% dry matter. Silage yield is whole-plant yield at harvest moisture. Grain harvested Oct. 12, 1999, and adjusted to 15.5% moisture. [2] See "Test Results" text for description of concentration items.

Moisture, yield and quality traits for Early relative maturity corn hybrids at Rosemount, 1999.

		Yield[1]				Concentration, Percent[2]			
Brand	Hybrid	Moisture, Percent	Grain, bu/a	DM, ton/a	Silage, ton/a	CP	ADF	NDF	IVDDM
Wensman	W5258Bt	60.7	186	9.8	25.0	6.9	22	37	73
Heartland Hybrids	TH289	61.7	164	8.6	22.5	7.0	24	40	72
Dekalb	DK440	61.8	214	9.9	25.9	6.1	23	39	71
Dairyland	Stealth 1499	62.0	185	9.3	24.5	6.8	23	40	72
Dairyland	Stealth 1203	62.1	199	9.8	25.8	6.6	23	38	72
Heartland Hybrids	TH295	62.8	190	10.2	27.3	6.6	26	44	69
Dairyland	Stealth 1297	63.0	183	10.1	27.2	6.7	23	38	73
Kaltenberg	K8098LF	63.2	177	9.9	26.8	6.9	23	39	72
Dairyland	DST 10212	63.5	171	10.2	27.9	6.2	25	42	71
Dekalb	DK477	63.6	189	9.5	26.2	6.5	24	41	71
Dekalb	DK493BtX	64.2	202	10.0	27.9	6.4	23	39	72
Kaltenberg	K8094LF	65.5	165	9.0	26.3	7.2	25	42	70
Early RM Averages		62.8	186	9.7	26.1	6.7	24	40	72
LSD (0.05)		2.2	22	ns	2.5	ns	ns	4	ns

[1] DM yield is whole-plant yield at 100% dry matter. Silage yield is whole-plant yield at harvest moisture. Grain harvested Oct. 12, 1999, and adjusted to 15.5% moisture. [2] See "Test Results" text for description of concentration items.

Names and addresses of companies participating in the 1999 hybrid corn silage trials.

Cargill, P.O. Box 5645, Minneapolis, MN 55440

Dahlco Seeds, Inc., 14730 15th St. SW, Cokato, MN 55321

Dairyland Seed Company, Inc., P.O. Box 958, West Bend, WI 53095-0958

Epley Brothers Hybrids, 22494 Yale Avenue, P.O. Box 310, Shell Rock, IA 50670

Garst Seed Company, 2369 330th St., P.O. Box 500, Slater, IA 50244

Heartland Hybrids, P.O. Box J, Dassel, MN 55325

J.C. Robinson Seed Company, 100 J.C. Robinson Boulevard, P.O. Box A, Waterloo, NE 68069

Kaltenberg Seeds, 5506 State Hwy 19, P.O. Box 278, Waunakee, WI 53597

Monsanto, 3100 Sycamore Road, De Kalb, IL 60115

Trelay Seed Company, 11623 Hwy 80, Livingston, WI 53554-9799

Wensman Seed Company, P.O. Box 190, Wadena, MN 56482

Moisture, yield and quality traits for Late relative maturity corn hybrids at Rosemount, 1999.

		Yield [1]				Concentration, Percent [2]			
Brand	**Hybrid**	Moisture, Percent	Grain, bu/a	DM, ton/a	Silage, ton/a	CP	ADF	NDF	IVDDM
Dairyland	Stealth 1203	57.2	189	10.3	24.2	5.9	24	41	70
Wensman	W5308Bt	59.2	189	9.0	22.1	5.8	25	40	72
Mycogen	TMF100	59.5	159	10.6	26.2	5.6	26	43	69
Trelay	5700	60.5	198	10.4	26.2	6.3	26	42	71
Heartland Hybrids	TH301	60.5	174	9.9	25.0	5.4	27	44	70
Kaltenberg	K8104LF	60.6	149	9.3	23.5	6.3	25	42	70
Dairyland	Stealth 1501	60.8	183	10.6	27.1	6.2	25	41	71
Cargill	3711FQ	61.5	172	10.1	26.2	5.9	24	41	70
Heartland Hybrids	TH305	62.9	183	10.8	29.1	6.2	24	41	72
Trelay	SP692	63.3	212	10.7	29.2	6.2	23	37	74
Golden Harvest	H-8250	63.7	201	10.7	29.5	6.2	24	39	73
Late RM Averages		60.9	183	10.2	26.2	6.0	25	41	71
LSD (0.05)		3.4	ns	ns	2..1	0.6	ns	ns	3

[1] DM yield is whole-plant yield at 100% dry matter. Silage yield is whole-plant yield at harvest moisture. Grain harvested Oct. 12, 1999, and adjusted to 15.5% moisture. [2] See "Testing Results" text for description of concentration items.

Forage, grass, oilseed and small-grain organizations

These organizations work in many ways in support of the commodities they represent and to provide opportunities to their members. Contact them directly for specific information about their roles and services.

Minnesota Association of Wheat Growers and Minnesota Wheat Research and Promotion Council
2600 Wheat Drive
Red Lake Falls, MN 56750
Phone: 218-253-4311
Fax: 218-253-4320
E-mail: mnwheat@redlakefalls.polaristel.net
Web Address: http://www.smallgrains.org

Minnesota Approved Seed Conditioners and Marketing Association
P.O. Box 303
Argyle, MN 56713
Phone: 218-437-6638
Fax: 218-437-6392

Minnesota Canola Council
1306 West County Road F, #109
St. Paul, MN 55112
Phone: 651-638-9883
Fax: 651-638-0756

Minnesota Barley Growers Association and Minnesota Barley Research and Promotion Council
2600 Wheat Drive
Red Lake Falls, MN 56570
Phone: 218-253-4311
Fax: 218-253-4320
E-mail: mnbarley@redlakefalls.polaristel.net

Minnesota Corn Growers Association and Minnesota Corn Research and Promotion Council
738 First Avenue East
Shakopee, MN 55378
Phone: 612-233-0333
Fax: 612-233-0420

Minnesota Crop Improvement Association
1900 Hendon Avenue
St. Paul, MN 55108
Phone: 612-625-7766
Fax: 612-625-3748
E-mail: beilx001@gold.tc.umn.edu
Web Address: http://www.mncia.org

Minnesota Forage and Grassland Council
411 Borlaug Hall
1991 Buford Circle
St. Paul, MN 55108
Phone: 651-436-3930
Fax: 651-436-7210
E-mail: mfgc@coafes.umn.edu

Minnesota Seed Producers and Promotion Association
Mac Ehrhardt, Secretary
P.O. Box 127
Albert Lea, MN 56007
Phone: 507-373-3161

Minnesota Soybean Growers Association and Minnesota Soybean Research and Promotion Council
360 Pierce Avenue
Suite #110
North Mankato, MN 56003
Phone: 507-388-1635
Fax: 507-388-6751
Web address: http://www.mnsoybean.org

Northern Minnesota Bluegrass Growers Association
31154 430th Avenue
Roseau, MN 56751-8413
Phone 218-463-2119

Grain

Test Locations

Test zones, locations and maturities are as follows,

Southern Zone, Lamberton, Waseca and Plainview

Early Maturity Trial - 105 Relative Maturity (RM) and earlier

Late Maturity Trial - 110 and 115 RM

Central Zone, Morris and Rosemount

Early Maturity Trial - 95 RM and earlier

Late Maturity Trial - 100 through 105 RM

Northern Zone, Staples and Rothsay

All entries 97 RM and earlier

Testing Procedure Entries,

Each corn seed company could enter up to six hybrids per zone. Entries in each trial were based on the Relative Maturity (RM) provided by the company. The University of Minnesota Corn Testing Committee could also choose and enter hybrids in each test, for this reason there may be more than six hybrids for a company in a test.

Presentation of Data

Yields are given for individual locations along with yields and harvest moisture contents averaged across locations for 1999. Hybrids are ranked within a maturity group by moisture content averaged across locations for 1999.

Least Significant Difference

We show LSD values with a 0.2 probability level which means that when two hybrids differ in yield by the LSD value or more one can be 80% confident that the two hybrids differ in yield potential. The higher yielding one is the better hybrid from the yield standpoint. If the yield difference between two hybrids is less than the LSD, the two hybrids probably do not differ significantly in yield potential.

How to Use the Results

The best indication of performance next year comes from the performance shown in the multiple location yield column. Yields from individual locations are given, but more emphasis should be given to the multiple location yield data. Ranking of hybrids on the basis of yield from high to low may change from location to location.

Names and addresses of companies participating in the 1999 trials.

Agripro Seeds Inc., Box 250, Brookings, SD 57006

Albert Lea Seed House (Viking Hybrids), Box 127, 1414 W. Main, Albert Lea, MN 56007

Anderson Seeds, Rt. 3, Box 94, St. Peter, MN 56082

Brown Seed Farms Inc., N1279 530th St., Bay City, WI 54723

Cargill Hybrid Seeds, Box 5645, Minneapolis, MN 55440

Dahlco Seeds, 14730 15Th St. SW, Cokato, MN 55321

Dahlman Seed Co., 73504-200th St., Dassel, MN 55325

Dairyland Seed Co., Inc. (Stealth, DST), Box 958, West Bend, WI 53095

Monsanto Co. (Dekalb, Asgrow), 3100 Sycamore Rd., DeKalb, IL 60115

Epley Bros. Hybrids, Inc., 22494 Yale Ave., Shell Rock, IA 50670

Fontanelle Hybrids, Rt. 1, Box 18, Nickerson, NE 68044

Garst Seed Co., 3469 330th St., Box 500, Slater, IA

Interstate Payco Seed Co., Box 338, West Fargo, ND 58078

Hyland Seeds, Blenheim, Ontario, Candada NOP 1A0

J.C. Robinson Seed Co. (Golden Harvest), 100 Robinson Blvd. Waterloo, NE 69069

Jung Farms Inc., 341 So. High St., Randolph, WI 53956

Kaltenberg Seed Farms, Inc., 5506 Hwy 19, Waunakee, WI 53597

Kruger Seed Co., Box A, Hwy 20 East, Dike, IA 50624

KSC/Challenger Seed Co., Box A, Dike, IA 50624

L.G. Seeds Inc., 4001 N. War Memorial Dr., Peoria, IL 61614

Mallard Seed Co. Inc., 311 West Broadway, Plainview MN 55964

Mycogen Plant Sciences, Box 21428 1340 Corporate Center, St. Paul, MN 55121-1428

NC+, Box 4408, Lincoln, NE 68504

NetSeeds Inc., 9001 Hickman Rd, Johnston, IA 50131

Novartis Seeds (NK Brand), Box 959, Minneapolis, MN 55440-0959

Pioneer Hi-Bred International., Inc., 130 SE Willmar Ave, Willmar, MN 56201

Ramy International Ltd, 1329 N Riverfront Dr., Mankato, MN 56001

Renk Seed Co., 6800 Wilburn Rd., Sun Prairie, WI 53590

Renze Hybrids, Inc., RR 3, Box 235, Carroll, IA 51401

Sand Seed Service, Box 648, 4765 Hwy 143, Marcus, IA 51035

Seeds 2000, Box 200 Breckenridge, MN 56520

Terning Seeds Inc., 15365 60th St. SW. Cokato, MN 55321

Top Farm Hybrids, Box 850, Cokato, MN 55321

Trelay, Inc., RR 1, Livingston, WI 53554

United Suppliers, Inc., 30473 260th St., Box 538, Eldora IA 50627

Wensman Seed Co., Box 190, Wadena, MN 56482

However, high-yielding hybrids at one location usually are high-yielding hybrids at another location and the multiple-location average is the best predictor of yield performance next year.

Corn Planting Rate and Date

Bushel Weight, Pounds 56
Planting Rate, Seeds/Acre 33,000
Planting Date.....April 15 - May 5

Individual trial information, 1999.

Location	Cooperators	Previous Crop	Planting Date	Harvest Dates	Tillage	Soil Tests PH	Soil Tests P	Soil Tests K	Fertilizer Amount[1] and Time Applied	Herbicides and Application
Lamberton	Steve Quiring Paul Porter	Soybean	Apr 30	Oct 8	Field Cultivator One pass	6.0	39	187	150-0-0 fall	Frontier,PPI Hornet,Clarity,Early Post
Waseca	Tom Hoverstad	Soybean	Apr 28	Oct 10	Fall chisel Spring field cult	6.8	14	195	0-150-0 fall 140-0-0 spring	DoublePlay,PPI Accent Gold,Post
Plainview	Bruce Ihrke	Soybean	Apr 29	Oct 28	Fall chisel Spring field cult	7.0	68	164	140-0-0	Dual,PPI Accent Gold,Post
Morris	George Nelson	Wheat	May 20	Oct 21	Fall chisel Spring field cult	7.9	16	243	120-46-60 fall	Surpass,Pre Hornet,Post
Rosemount	Jerry Holz	Soybean	May 10	Oct 29	Fall chisel Spring field cult	—	—	—	125-0-30 spring	Lasso,Pre Accent + Buctril,Post
Staples	Mel Wiens	Corn	May 17	Oct 19	Plow	—	—	—	210-10-60 spring	Harness + Bladex,Pre
Rothsay	Troy Larson	Wheat	May 14	Oct 20	Fall chisel Spring field cult	—	—	—	80-80-70	DoublePlay,PPI Buctril-atrazine,Post

[1] Pounds of N, P and K, respectively. [2] Not available.

Early maturity hybrids, southern locations, 1999.

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Lamberton	Yield, Bushels/Acre at Plainview	Yield, Bushels/Acre at Waseca	Average Across Locations Bu/Acre	Average Across Locations % Moisture
97 RM and earlier hybrids							
Dekalb	DK477	97	183	199	198	193	15.0
KSC/Challenger	K9896	93	182	203	195	193	15.2
Viking	7970	96	172	212	181	188	15.5
KSC/Challenger	Ex. 2098	95	163	203	177	181	15.5
Brown	4641	97	195	198	188	193	15.7
Wensman	W 5258 Bt	94	167	216	175	186	15.8
Wensman	MAX 127	97	178	195	188	187	16.0
Jung	2488A	97	171	224	176	190	17.0
Kruger	K-9898+	95	170	220	189	193	17.2
97 RM and earlier averages			176	208	185	190	15.9
98 to 102 RM hybrids							
AgriPro	AP 9313	100	169	194	188	184	15.1
Dahlman	1699	100	195	214	183	197	15.2
Dekalb	DK493BtX	99	194	212	201	202	15.3
Epley	E1160	98	175	205	181	187	15.3
Wensman	W 5308Bt	99	169	212	176	186	15.3
Kaltenberg	K4809	100	178	219	187	194	15.5
Cargill	4021Bt	100	170	210	181	187	15.5
Jung	6655RR	100	158	210	184	184	15.6
NK brand	NX 4217	100	169	205	180	185	15.6
Top Farm	TFsx 2201	101	178	208	189	192	15.7
High-Cycle	HC 7534 RR	100	174	206	176	185	15.7
Wensman	W 5319Bt	101	169	204	189	187	15.7
Trelay	5700	98	177	194	182	184	15.8
Anderson Seeds	6004RR	100	163	207	185	185	15.8
Dekalb	DK520RR	102	197	227	199	208	15.8
Dekalb	DK507	100	185	210	175	190	16.0
Jung	2440WX	99	173	197	191	187	16.1
Dekalb	DK525	102	187	232	220	213	16.1
Mycogen	2525	100	166	207	181	184	16.2
Kruger	K-9902Bt	99	176	199	178	184	16.2
LG Seeds	LG 2484	99	175	199	182	185	16.3

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
Top Farm	TFsx 2100	102	187	203	175	189	16.3
Kruger	K-9802RR	99	171	204	189	188	16.4
Kaltenberg	K5005	100	178	201	173	184	16.4
Mycogen	2544	101	164	182	163	170	16.4
Dairyland Stealth	1401	100	168	207	183	186	16.5
Sands	SOI 9027	100	182	205	184	190	16.5
Anderson Seeds	6002	102	186	200	186	191	16.6
Asgrow	RX481	101	174	198	193	189	16.6
Jung	6540Bt	101	176	204	185	189	16.6
Top Farm	TFsx 105 Bt	102	181	211	203	198	16.6
Golden Harvest	H-7798Bt	102	164	192	169	175	16.7
Jung	2561	102	176	196	175	183	16.7
Dahlman	D102Bt	102	186	208	182	192	16.7
High-Cycle	HC 7529Bt	102	196	204	230	210	16.8
Sands	SOI 9009	100	163	218	196	193	16.9
Anderson Seeds	6002Bt	102	179	196	183	186	16.9
Fontanelle	4218	102	191	183	178	184	16.9
AgriPro	AP 9355 Bt	102	206	205	206	205	17.0
Viking	6901	100	175	200	178	184	17.0
Kruger	K-9903Bt	100	199	202	220	207	17.0
NC+	1799	100	159	209	186	185	17.0
Renk	RK606	100	176	210	208	198	17.0
Epley	E1470 Bt	102	169	197	172	179	17.0
Brown	5341	102	179	223	152	185	17.1
Trelay	5600	98	175	208	202	195	17.2
Mycogen	2566	102	167	202	167	179	17.2
Fontanelle	4008	100	168	189	175	177	17.2
Kaltenberg	K4907	100	194	211	173	192	17.3
AgriPro	AP 9368	102	188	194	160	181	17.4
Dairyland Stealth	1108	102	188	208	182	193	17.5
Pioneer	36R10	101	188	211	203	200	17.6
LG Seeds	LG 2499	101	180	217	201	199	17.7
Kruger	K-9905	102	174	225	177	192	17.8
Wensman	W 5329Bt	102	194	208	200	201	17.8
KSC/Challenger	9905Bt	102	152	197	173	174	18.3
Kruger	K-2002	99	161	196	165	174	18.5
Pioneer	36B08	102	189	205	200	198	18.9
98 to 102 RM averages			178	205	185	189	16.6
103 to 105 RM hybrids							
Kaltenberg	K5788 RR	105	169	207	183	186	15.6
Garst	8707	103	182	216	193	197	15.7
Jung	2510A	103	199	194	209	201	15.8
Top Farm	TFsx 8103 RR	103	154	215	176	182	16.0
Viking	5000	103	171	229	191	197	16.1
Cargill	4220Bt	105	192	215	203	203	16.1
NK brand	N 4640	103	169	199	186	185	16.1
Renk	RK648	103	187	192	206	195	16.2
Cargill	4521Bt	105	180	228	228	212	16.2
Kaltenberg	K5707	105	165	194	202	187	16.2
Viking	Bt 5950	104	184	214	219	206	16.5
NC+	2839	105	189	206	199	198	16.6
Renze	8158Bt	105	184	197	182	188	16.6

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at			Average Across Locations	
			Lamberton	Plainview	Waseca	Bu/Acre	% Moisture
Jung	6616Bt	105	202	206	209	206	16.7
Mallard	BT 2660	103	180	197	185	187	16.7
Dekalb	DK539	103	187	210	192	197	16.8
NK brand	NX 4616	105	193	191	201	195	16.8
Kruger	Ex. 908	105	200	239	209	216	16.8
Renze	5208IP	105	168	217	200	195	16.8
Renk	RK648Bt	105	177	209	217	201	16.8
Kaltenberg	K5454Bt	103	183	213	206	200	16.9
Top Farm	TFsx 7102 Bt	103	180	204	184	189	16.9
Seeds 2000	3105	105	192	208	181	194	16.9
Garst	8608 Bt	105	188	204	222	205	17.0
Renze	6210	105	184	207	191	194	17.0
KSC/Challenger	EX 908A	105	198	212	188	199	17.0
Golden Harvest	H-8067Bt	104	186	203	169	186	17.1
Dairyland Stealth	1504 Bt	104	202	203	202	202	17.1
Jung	2590	105	188	201	207	199	17.1
Dekalb	DK537	103	197	227	217	214	17.1
Renze	6200	105	180	186	183	183	17.1
Dahlman	D106Bt	105	183	203	191	192	17.1
Epley	E 1510Bt	104	189	205	207	200	17.2
Seeds 2000	3103	103	176	194	181	184	17.3
Wensman	W 5359Bt	105	165	196	175	179	17.3
Dekalb	DK545BtY	104	181	235	215	210	17.3
Trelay	6005	103	164	214	197	191	17.3
Kruger	9907RR	104	187	206	190	194	17.4
Kaltenberg	K5808	105	193	212	208	204	17.4
Cargill	5212	105	199	232	203	211	17.4
KSC/Challenger	K-2008	105	196	242	220	219	17.4
Jung	2579	104	176	202	190	189	17.5
Top Farm	TFsx 2202	104	163	200	168	177	17.5
Dairyland Stealth	1406	105	190	223	197	203	17.5
Pioneer	36Y96	103	190	206	178	192	17.5
Epley	E 1500	105	169	210	192	190	17.6
Dahlco	X-8054	105	197	233	201	210	17.6
Trelay	7002	105	184	223	190	199	17.8
Sands	SOI 9067	105	180	208	208	199	17.8
KSC/Challenger	K-9806B	103	209	235	211	218	17.8
Dekalb	DK551BtY	105	196	236	229	220	17.9
Pioneer	36D14	103	191	226	204	207	18.0
LG Seeds	LG 2512	103	192	207	196	198	18.1
Viking	R 6006	104	193	232	183	202	18.1
LG Seeds	LG 2530	105	199	203	193	198	18.2
Sands	SOI 9058	105	195	225	201	207	18.4
Top Farm	TFsx 106 Bt	105	195	185	193	191	18.5
KSC/Challenger	K-9907Bt	104	180	177	204	187	18.7
Pioneer	35P12	104	207	221	202	210	18.7
KSC/Challenger	Ex. 006	103	185	187	195	189	18.9
Dairyland Stealth	1507	105	213	214	205	211	19.3
103 to 105 RM averages			186	210	198	198	17.2
Southern locations early maturity averages			181	208	191	194	16.8
LSD(0.20)			12	14	16	8	0.5

Late maturity hybrids, southern locations, 1999.

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Lamberton	Plainview	Waseca	Average Across Locations Bu/Acre	% Moisture
Later than 105 RM hybrids							
Wensman	W 5378Bt	106	165	213	187	188	15.7
NetSeeds	NET 1040	108	183	203	210	199	16.4
Mallard	BT 2700	106	196	203	221	207	16.6
Kaltenberg	K6006 IMI	106	146	196	166	169	16.8
Dairyland Stealth	1506 Bt	106	171	214	207	197	17.0
Anderson Seeds	4028	106	183	226	206	205	17.1
United Suppliers	US C1079RR	107	187	228	176	197	17.4
Renze	6229	106	151	191	197	180	17.5
Asgrow	RX601YG	110	194	245	203	214	17.6
NC+	3289	110	171	204	226	200	17.6
Viking	4004	107	187	210	157	185	17.7
Renk	RK706Bt	109	158	185	175	173	17.7
Renk	RK706	107	156	196	183	178	17.7
Top Farm	TFsx 2111	110	173	208	203	195	17.8
Mycogen	2657	106	195	239	220	218	17.8
Viking	4020	107	177	205	198	193	17.9
Anderson Seeds	4000A	106	168	200	190	186	17.9
Anderson Seeds	4000Bt	106	167	192	177	179	18.0
Renze	8248Bt	108	181	194	175	183	18.1
Mycogen	2652	106	183	217	204	201	18.2
Prairie Gold	PG 1589	109	173	222	170	188	18.2
Brown	6341	107	180	217	190	196	18.2
Pioneer	34G82	106	178	260	225	221	18.2
United Suppliers	US C1069Bt	106	164	194	195	184	18.4
Mallard	UC 2682	106	190	213	188	197	18.5
Top Farm	TFsx 2104 Bt	106	167	181	172	173	18.6
Epley	E 2480	110	193	232	175	200	19.1
Renze	6260	109	197	202	196	198	19.2
Golden Harvest	H-9095Bt	112	192	236	244	224	19.2
Top Farm	TFsx 2107	107	191	207	194	197	19.3
Renk	RK778	109	194	232	194	207	19.5
NK Brand	NX 5867	110	203	234	216	218	19.5
United Suppliers	US C1099	109	204	225	209	212	19.5
Renze	6239	108	163	226	188	192	19.6
Prairie Gold	PG 1586	107	188	213	177	193	19.6
Golden Harvest	H-8890Bt	111	202	236	222	220	19.8
Garst	8600 BLT	106	163	204	208	191	20.7
Southern locations late maturity averages			179	214	196	196	18.2
LSD(0.20)			12	15	26	11	0.6

Early maturity hybrids, central locations, 1999.

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Morris	Yield, Bushels/Acre at Rosemount	Average Across Locations Bu/A	Average Across Locations % Moisture
92 and earlier RM hybrids						
Dekalb	DK405	90	189	198	194	16.0
Dahlco	X-8891	90	176	189	182	16.9
Jung	2370	89	178	184	181	17.0
Dairyland Stealth	1289	90	182	184	183	17.0
Dekalb	DK389BtY	88	178	177	177	17.3
Epley	E1122	92	180	183	182	17.4
Pioneer	38K06	92	177	183	180	17.5
Dahlman	1488	90	184	178	181	17.5
Dahlman	1490	90	202	172	187	17.9
Cargill	2777	90	192	183	188	17.9
Cargill	2610	90	161	175	168	18.0
Dekalb	DK427	92	196	204	200	18.2
Prairie Gold	PG 1355	92	160	168	164	18.2
Wensman	5088Bt	85	176	184	180	18.3
Wensman	W 5178Bt	91	168	172	170	18.8
Wensman	MAX 78	90	173	176	174	18.9
LG Seeds	LG 2411	91	199	186	193	19.1
92 RM and earlier averages			181	182	181	17.7
93 to 97 RM hybrids						
Wensman	W 5258 Bt	94	197	193	195	17.4
Mallard	UC 414	95	166	192	179	17.5
Payco	457	95	185	192	189	17.6
Dahlman	1599	95	186	203	195	17.7
Kaltenberg	K4508	96	195	191	193	17.7
Anderson Seeds	7525	95	194	185	189	17.8
Garst	N7870	95	176	180	178	17.8
Seeds 2000	2951	95	190	184	187	17.8
Dekalb	DK477	97	211	199	205	17.8
LG Seeds	LG 2421	93	189	166	178	18.0
Top Farm	TFsx 2196	96	184	172	178	18.1
Garst	8830	94	187	194	191	18.1
Trelay	4002	95	192	185	189	18.2
Renk	RK546	95	208	201	205	18.3
Terning	TS 8266	96	197	211	204	18.3
KSC/Challenger	K9896	93	198	204	201	18.4
Epley	E1130	95	202	201	201	18.4
Wensman	MAX 007	93	187	196	192	18.5
Dahlco	X-8931	93	182	176	179	18.5
Garst	8820	95	181	179	180	18.5
Dekalb	DK440	94	214	206	210	18.6
LG Seeds	LG 2442	95	183	202	193	18.6
Kaltenberg	K4707	96	192	191	192	18.7
Kaltenberg	K4606	95	204	204	204	18.7
Pioneer	38W36	93	188	178	183	18.7
Kaltenberg	K3904	93	192	181	186	18.8
Brown	4680	97	194	186	190	18.8
Hyland	HL 2507	95	181	190	186	18.8
NK Brand	N 3030Bt	95	176	197	187	18.8
Dahlco	2394	94	211	204	208	18.8
Pioneer	38P06	95	186	197	192	18.9

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Morris	Yield, Bushels/Acre at Rosemount	Average Across Locations Bu/A	Average Across Locations % Moisture
Hyland	HL 2505	95	186	204	195	19.0
Renk	RK569	97	206	187	197	19.0
Wensman	MAX 127	97	205	199	202	19.1
Mycogen	2424	95	176	175	175	19.2
Jung	2436	94	193	194	193	19.2
Brown	4641	97	198	200	199	19.2
Dairyland Stealth	1499	95	187	184	186	19.4
Garst	N7801	97	190	208	199	19.4
LG Seeds	LG 2473	96	182	191	187	19.6
Top Farm	TFsx 795 Bt	95	182	172	177	19.7
KSC/Challenger	Ex. 2098	95	191	201	196	19.8
Dairyland Stealth	1297	95	186	201	194	20.1
Kruger	K-9898+	95	206	194	200	20.2
Jung	2488A	97	187	203	195	20.2
Hyland	HL 2521	95	194	175	185	20.7
Hyland	HL 2614	95	192	197	195	21.3
93 to 97 RM averages			191	192	192	18.8
98 and later RM hybrids						
Anderson Seeds	6076	98	190	203	196	18.3
Epley	E1160	98	194	190	192	18.6
Top Farm	TFsx 2101	99	188	190	189	18.8
Wensman	W 5308Bt	99	189	205	197	19.0
Pioneer	36F30	99	219	200	210	19.2
Garst	8766	99	203	188	196	19.3
Dekalb	DK493BtX	99	213	213	213	19.4
Pioneer	37R71	98	188	194	191	19.6
Kruger	K-9802RR	99	195	198	197	20.1
Trelay	5700	98	215	214	215	20.4
Trelay	5003	98	184	186	185	20.5
Trelay	5600	98	198	212	205	20.6
Kruger	K-9902Bt	99	187	195	191	21.1
LG Seeds	LG 2484	99	182	190	186	21.9
Kruger	K-2002	99	186	204	195	22.9
98 RM and later averages			196	199	197	20.0
Central locations early maturity averages			190	191	190	18.8
LSD(0.20)			13	12	9	0.4

Late maturity hybrids, central locations, 1999.

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Morris	Yield, Bushels/Acre at Rosemount	Average Across Locations Bu/A	Average Across Locations % Moisture
102 and earlier RM hybrids						
Kaltenberg	K4809	100	179	194	187	18.8
Dairyland Stealth	1496	100	184	202	193	18.9
Terning	TS 8311	102	170	125	147	19.0
Mallard	UC 585	100	181	201	191	19.2
Cargill	4021Bt	100	191	211	201	19.3
Dahlman	1699	100	170	200	185	19.3
Top Farm	TFsx 2201	101	203	192	198	19.4
Mallard	UC 595-A	100	198	191	195	19.4
AgriPro	AP 9313	100	192	201	196	19.5
Kaltenberg	K5005	100	186	175	180	19.7
Kaltenberg	K4907	100	186	212	199	19.8
Renk	RK659	100	165	167	166	19.9
Dekalb	DK507	100	194	192	193	20.2
Kruger	K-9903Bt	100	189	219	204	20.3
Renk	RK606	100	195	195	195	20.3
Seeds 2000	3102RR	100	169	189	179	20.3
Terning	TS 8322	102	177	168	173	20.4
Terning	TS 8303	100	208	208	208	20.5
Mycogen	2544	101	159	167	163	20.6
Mycogen	2525	100	181	193	187	20.7
Prairie Gold	PG 1532	102	180	177	178	20.7
Renk	RK681	102	178	173	175	20.8
Prairie Gold	PG 529 Bt	100	164	186	175	20.8
AgriPro	AP 9355 Bt	102	193	209	201	20.9
Pioneer	36R10	101	198	208	203	21.0
Dahlman	D102Bt	102	172	207	189	21.0
Wensman	W 5319Bt	101	184	198	191	21.1
Wensman	W 5329Bt	102	179	173	176	21.1
Brown	5341	102	178	175	177	21.3
Top Farm	TFsx 2100	102	182	193	188	21.3
Epley	E1470 Bt	102	189	204	196	21.3
Dairyland Stealth	1402	100	187	181	184	21.4
Golden Harvest	H-7773Bt	102	192	180	186	21.6
KSC/Challenger	Ex. 003	100	196	204	200	21.7
Dekalb	DK520RR	102	208	193	200	21.8
Dahlco	2501	101	201	188	195	22.3
Dairyland Stealth	1404	102	190	190	190	22.5
Hyland	HL 2626	100	184	174	179	22.7
Golden Harvest	H-7798Bt	102	191	183	187	22.8
Jung	2561	102	176	179	178	23.2
Garst	N8701Bt	102	179	167	173	23.7
United Suppliers	US C1029Bt	102	189	200	195	27.5
102 RM and earlier hybrid averages			185	189	187	20.9
103 and later RM hybrids						
Epley	E 1485 RR	104	203	191	197	18.5
Top Farm	TFsx 8103 RR	103	186	207	196	19.0
Jung	2510A	103	206	205	205	19.6
NK Brand	NX 4616	105	191	183	187	19.7
Terning	TS 8333	103	188	184	186	20.0
Garst	8707	103	192	202	197	20.3

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Morris	Yield, Bushels/Acre at Rosemount	Average Across Locations Bu/A	Average Across Locations % Moisture
Kaltenberg	K5454Bt	103	178	224	201	20.4
Renk	RK648	103	187	215	201	20.7
Garst	8608 Bt	105	197	205	201	20.9
Cargill	4521Bt	105	197	217	207	22.2
Epley	E 1500	105	193	204	198	22.3
Golden Harvest	H-8063Bt	104	188	204	196	22.5
Golden Harvest	H-8067Bt	104	187	192	190	22.7
United Suppliers	US E1050	105	209	196	202	22.7
NetSeeds	NET 1056	105	191	209	200	23.8
Jung	2579	104	182	173	177	24.2
Terning	TS 8341 Bt	104	200	206	203	27.4
103 RM and later hybrid averages			193	201	197	21.6
Central locations late maturity averages			187	193	190	21.1
LSD(0.20)			13	14	10	0.9

Northern Locations, 1999.

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at Rothsay	Yield, Bushels/Acre at Staples	Average Across Locations Bu/A	Average Across Locations % Moisture
77 and earlier RM hybrids						
NK Brand	NX 1107	75	149	163	156	20.2
Dairyland Stealth	1275	75	160	14	153	24.2
Proseed	EPW 76	76	149	157	153	24.6
77 RM and earlier hybrid average			153	156	154	23.0
78 to 82 RM hybrids						
Pioneer	39A26	80	169	141	155	21.1
Cargill	1877	80	146	154	150	21.6
Proseed	EK 4828	82	153	142	147	21.6
Dairyland Stealth	1480	80	169	166	168	21.6
Top Farm	TFsx 2182	82	150	167	158	21.6
NK Brand	NX 2127	80	161	196	179	21.8
Mycogen	2141	81	151	143	147	22.1
Wensman	5018Bt	81	148	182	165	22.1
Jung	2225	79	162	167	164	22.1
Renk	RK133	80	150	167	159	22.1
Prairie Gold	PG 1313	80	148	163	156	22.5
Renk	RK221	82	155	155	155	22.7
Brown	1688	79	167	160	163	23.5
Hyland	HL 2202	80	132	153	142	23.6
Trelay	1007	80	148	155	152	23.9
Dahlco	X-8851	80	157	158	158	27.0
Hyland	HL 2333	80	129	166	148	28.2
78 to 82 RM hybrid averages			153	161	157	22.9
83 to 87 RM hybrids						
Dekalb	DK355	85	161	186	174	21.6
Pioneer	39D81	85	176	175	176	21.9
Garst	8972IT	87	168	193	180	22.0
Brown	1967	83	166	177	172	22.2
Top Farm	TFsx 2184	84	165	173	169	22.2
Renk	RK232	85	153	201	177	22.4

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at		Average Across Locations	
			Rothsay	Staples	Bu/A	% Moisture
NK Brand	N 17-C5	85	156	180	168	22.5
Garst	8966	87	150	174	162	22.6
Terning	TS 8121	85	155	169	162	23.0
Wensman	5088Bt	85	169	195	182	23.0
Top Farm	TFsx 2187	87	158	162	160	23.1
Proseed	185	85	134	142	138	23.2
Golden Harvest	H-6229	84	162	145	154	23.2
Mycogen	2242	86	154	163	159	23.4
LG Seeds	LG 2367	85	163	187	175	23.4
Hyland	HL 2303	85	123	144	133	23.6
Mallard	UC 382-B	85	169	147	158	23.6
Dairyland Stealth	1485	85	161	165	163	23.7
Garst	N6902	87	155	148	152	23.7
Wensman	5048Bt	84	165	155	160	23.8
Dekalb	DK334BtY	83	168	144	156	23.9
Garst	8975	87	128	170	149	24.0
Dahlman	1300	85	154	139	147	24.1
Kaltenberg	K2909	85	161	181	171	24.2
Renk	RK277	85	169	158	164	24.3
Dahlco	2287	87	157	153	155	24.4
Trelay	2008	87	158	175	166	25.0
Brown	2041	86	130	168	149	25.3
Mallard	UC 386-A	85	161	187	174	25.8
Jung	2285	85	158	185	171	25.9
Hyland	HL 2324	85	156	149	152	27.5
83 to 87 RM hybrid averages			157	167	162	23.6
88 to 92 RM hybrids						
Dekalb	DK405	90	173	191	182	22.3
Kaltenberg	K3404	89	164	156	160	23.1
NK Brand	N2555Bt	90	173	199	186	23.1
Kruger	Ex.902	89	170	180	175	23.1
NK Brand	NX 2527	90	168	191	179	23.2
Kaltenberg	K3303	88	155	186	171	23.3
Jung	2370	89	165	186	176	23.4
NK Brand	N24B9	90	172	170	171	23.4
Kruger	K-2091	88	151	175	163	23.5
Dahlman	1488	90	164	188	176	23.5
Hyland	HL 2240	90	155	170	162	23.7
Top Farm	TFsx 2191	91	156	179	168	23.9
Golden Harvest	H-6726	93	167	186	176	24.0
Terning	TS 8202	90	146	188	167	24.1
Kaltenberg	K3808	92	157	167	162	24.2
Dekalb	DK389BtY	88	140	186	163	24.2
Pioneer	39F06	88	176	187	182	24.3
Mallard	UC389-A	90	159	175	167	24.3
Mycogen	2250IMI	89	175	188	181	24.4
Pioneer	38K06	92	162	207	184	24.6
Cargill	2777	90	167	166	167	24.6
Renk	RK386	90	145	185	165	24.8
Kaltenberg	K4303	92	161	182	172	24.9
Terning	TS 8212	91	154	202	178	24.9
Seeds 2000	2901	90	165	189	177	25.1

Source / Brand	Hybrid	RM	Yield, Bushels/Acre at		Average Across Locations	
			Rothsay	Staples	Bu/A	% Moisture
Hyland	HL B275	90	130	192	161	25.2
United Suppliers	US C909	90	156	166	161	25.2
Cargill	2610	90	143	158	151	25.2
Top Farm	TFsx 2188	88	153	183	168	25.3
Garst	N8965	90	164	171	167	25.9
Wensman	W 5178Bt	91	144	155	150	26.2
Trelay	3700	90	155	181	168	26.4
Dahlman	1490	90	195	189	192	26.4
Wensman	MAX 78	90	154	207	180	27.1
Proseed	ET 92	92	149	183	166	27.2
Hyland	HL 2391	90	162	167	164	27.5
KSC/Challenger	K-2094	91	175	209	192	27.8
Dahlco	X-8902	90	165	162	164	28.0
88 to 92 RM hybrid averages			160	182	171	24.8
93 and later RM hybrids						
Wensman	W 5258 Bt	94	151	211	181	24.2
KSC/Challenger	K9896	93	172	215	193	25.0
Proseed	ES 4938	93	171	204	188	25.2
Kaltenberg	K4508	96	137	188	162	25.2
Jung	2436	94	150	187	169	25.6
Brown	3680	94	146	191	169	25.8
Proseed	ES 4968	96	163	190	177	25.9
Pioneer	38W36	93	174	203	188	25.9
Seeds 2000	2951	95	166	177	172	26.1
Golden Harvest	H-7076Bt	96	131	182	156	26.2
Kaltenberg	K4606	95	152	180	166	26.2
Pioneer	38P06	95	149	190	170	26.4
Mycogen	2424	95	155	185	170	26.8
United Suppliers	US C969	96	173	191	182	27.2
Wensman	MAX 007	93	167	201	184	27.2
KSC/Challenger	Ex. 2098	95	150	182	166	27.3
Kruger	K-9898+	95	159	201	180	27.5
Dairyland Stealth	1099 RR	97	171	160	165	27.6
Kaltenberg	K3904	93	175	174	175	27.9
Dairyland Stealth	1499	95	163	189	176	28.7
Kruger	K-9802RR	99	162	178	170	28.8
Dairyland Stealth	1501	95	149	164	157	32.4
93 RM and later hybrid averages			158	188	173	26.8
Northern locations averages			158	175	166	24.5
LSD(0.20)			20	21	15	1.3

Oat varieties are classed into groups under the headings Recommended, Not Adequately Tested, Special Purpose, and Other. Variety descriptions are arranged alphabetically within these groups. The relative maturities of varieties are indicated in the tables as date of heading, measured as days after planting, and varieties are listed in the tables in order of maturity.

Crown Rust Caution

Crown rust infection has dramatically increased in Minnesota oat fields since 1990, and at least five new races have been identified in recent years. As a result, varieties previously reported to have good crown rust resistance are now known to be vulnerable. Varieties with little or no rust resistance should be grown with caution.

Recommended Varieties

Belle – Late maturity, high yield, tall, fair lodging resistance, high test weight and very high groat percentage, yellow seed. Resistant to crown rust and smut, some tolerance to red leaf. Selected at Wis. AES. Released in 1995. Foundation seed available to certified seed producers only under a license/fee collection agreement. PVP (94)

Gem – Medium-late maturity, high yield, medium height, good lodging resistance, high test weight and groat percentage, yellow seed. Resistant to crown rust and smut, good tolerance to red leaf. Selected at Wis. AES. Released in 1995. Foundation seed available to certified seed producers only under a license/fee collection agreement. PVP (pending)

Milton – Medium-late maturity, high yield, medium height, good lodging resistance, medium test weight and groat percentage, yellow seed. Small resistance to crown rust, resistant to smut, susceptible to red leaf. Selected at Minn. AES. Released in 1994. PVP

Special Purpose Varieties

Pal – Forage establishment only. Medium-late maturity, low grain yield, very short, good lodging resistance, low test weight, medium groat percentage, yellow seed. Moderately susceptible to crown rust, susceptible to red leaf, resistant to smut. Selected at Minn. AES. Released in 1994 as a special-purpose forage oat variety. Pal has good forage yield with high levels of crude protein and good relative feed value, although no forage data are provided in this publication.

Paul – Hulless. Medium-late maturity, high yield for hulless cultivar, tall, very good lodging resistance; hulless, so very high test weight. Moderately susceptible to crown rust and red leaf. Resistant to smut. Selected at N.D. AES. Released in 1994. PVP (94)

Varieties Not Adequately Tested

Ebeltoft – No Minnesota data, but it is tall and six days later than Jerry; ivory seed. Selected at N.D. AES. Released in 1999. PVP (pending)

Jay – Medium maturity, high yield, short, very good lodging resistance, medium test weight and groat percentage. Resistant to crown rust, susceptible to smut, some tolerance to red leaf, ivory seed. Selected at Purdue AES. Released in 1998. *Because of smut susceptibility, planting only treated seed is recommended.* PVP (pending)

Jud – Late maturity, high yield, very tall, poor lodging resistance. Very high test weight and groat percentage, white seed. Resistant to crown rust and smut, good tolerance to red leaf. Selected at N.D. AES. Released in 1998. PVP (pending)

Triple Crown – Late, medium yield, tall, very good lodging resistance, low test weight and groat percentage. Resistant to crown rust, moderately resistant to smut and susceptible to red leaf, white seed. Selected by the Svalöf Weibull Seed Company and distributed by Svalöf Weibull Seed Company, Lindsay, Ontario Canada. They can be contacted at www.swseed.ca.

Vista – Medium maturity, high yield, tall, average lodging resistance, medium test weight and groat percentage, yellow

Oat yield, bushels/acre by location, 1997-1999.

Variety	Rosemount	Waseca	Lamberton	Morris	Crookston	5-Location Average	Grand Rapids [1]
Riser [3]	59	57	58	92	104	74	78
Jerry	78	68	79	113	112	90	120
Rodeo	85	88	98	132	127	106	122
Blaze	85	75	92	104	119	95	134
Chaps	88	90	95	134	110	103	130
Gem	86	90	103	123	121	104	121
Vista [2]	85	104	94	126	129	108	n/a
Milton	79	84	85	122	126	99	116
Jud [3]	87	74	104	106	111	97	120
Belle	78	84	93	111	124	98	109
Paul [3]	40	55	75	70	91	66	31
Triple Crown [2]	48	103	70	83	147	90	n/a
LSD	7.6	9.2	12.3	16.1	13.0	5.4	21.7

[1] 1998 data only. [2] 1999 data only. [3] 1998 and 1999 data only.

seed. Resistant to crown rust and smut, susceptible to red leaf. Selected at Wis. AES. Released in 1999. PVP **(pending)**

Youngs – No Minnesota data, but it is medium height and six days later than Jerry, white seed. Selected at N.D. AES. Released in 1999. PVP **(pending)**

Other Varieties

Blaze – Medium maturity, high yield, medium height, good lodging resistance, very high test weight and groat percentage. Ivory seed. Susceptible to rust and smut, very tolerant to red leaf. Selected at Ill. AES. Released in 1997. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(pending)**

Chaps – Medium maturity, high yield, good lodging resistance, high test weight and groat percentage. Yellow seed. Susceptible to crown rust and smut, tolerant to red leaf. Selected at Ill. AES. Released in 1997. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(pending)**

Dane – Early maturity, lower yield, short, good lodging resistance, fair test weight, high groat percentage, yellow seed. Moderately resistant to crown rust and smut, susceptible to red leaf. Selected at Wis. AES. Released in 1990. Foundation seed available to certified seed producers only under a license/fee collection agreement. PVP

Don – Early maturity, medium yield, short, fair lodging resistance, medium test weight and groat percentage, low protein percentage, white seed. Susceptible to crown rust and red leaf, some resistance to smut. Selected at Ill. AES. Released in 1985. *Because of smut susceptibility, planting only treated seed is recommended.*

Ida – Late maturity, medium yield and height, good lodging resistance, fair test weight and groat percentage. Ivory seed. Susceptible to rust, moderately susceptible to smut and tolerant to red leaf. Selected at the Mich. AES. Released in 1997. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(pending)**

Jerry – Medium maturity, medium yield, tall, good lodging resistance, very high test weight, high groat percentage, ivory seed. Moderately susceptible to crown rust, susceptible to smut, tolerant to red leaf. Selected at N.D. AES. Released in 1994. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(94)**

Oat yield, bushels/acre at off-station locations, 1999 only.

	Roseau	Stephen	Winona*	Wells*	Madison*
Variety					
Riser	117	101	20	43	25
Jerry	129	144	40	29	73
Blaze	130	135	38	32	67
Rodeo	156	168	48	49	59
Chaps	141	138	37	48	71
Gem	120	145	44	49	51
Vista	177	131	n/a	n/a	n/a
Milton	158	136	47	40	40
Jud	178	145	40	46	47
Belle	154	143	36	55	61
Paul	95	101	28	32	44
Triple Crown	126	149	n/a	n/a	n/a
LSD	56.2	34.0	12.5	8.6	17.3

* These locations are pesticide-free/organic farmer fields and Madison is planted no-till.

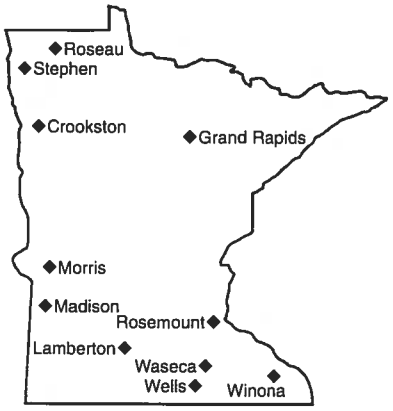
Oat traits, 1997-1999.

	Days After Planting To Heading	Height Inches	Lodging, 1=Erect 5=Flat	Test Weight, Lb/Bu	Groat %	Crown Rust[1]	Smut Score[2]	BYD Score[3]
Variety								
Riser	54	35	3.9	40	74.0	MR	MR	6.5
Jerry	59	41	3.8	39	69.7	S-MS	S	4.3
Rodeo	60	39	2.2	37	70.3	MS	MS	3.0
Blaze	60	38	3.3	38	71.0	MS	S	3.0
Chaps	60	38	3.4	38	70.3	MS	S	3.0
Gem	60	40	2.7	39	71.3	MR	R	3.0
Vista	61	41	2.5	38	69.7	HR	R	7.0
Milton	63	36	2.5	36	70.0	MS	MR	6.0
Jud	64	43	3.6	39	68.0	MR	R	4.5
Belle	46	41	2.5	39	73.7	MR	MR	6.5
Paul (hulless)	65	41	2.3	46	97.7	MS	MR	5.5
Triple Crown	69	43	1.8	34	66.7	R	MR	6.5
Mean	61.5	39.6	2.9	38.5	72.7			

[1] HR=highly resistant R= resistant MR=moderately resistant, MS=moderately susceptible S=susceptible

[2] R=resistant MR=moderately resistant MS=moderately susceptible S=susceptible

[3] Barley yellow dwarf virus, 1=no symptoms, 9=dead



Locations of oat trials.

Jim – Early maturity, lower yield, short, good lodging resistance, high test weight and groat percentage, yellow seed. Small resistance to crown rust, resistant to smut, good tolerance to red leaf. Selected at Minn. AES. Released in 1996. PVP **(pending)**

Premier – Medium maturity, yield and height, good lodging resistance, medium test weight, groat percentage and protein percentage, yellow seed. Susceptible to crown rust, resistant to smut, some tolerance to red leaf. Selected at Minn. AES. Released in 1990. PVP

Riser – Early maturity, lower yield, short, fair lodging resistance. High test weight and groat percentage, yellow seed. Resistant to crown rust and smut, susceptible to red leaf. Selected at S.D. AES. Released in 1998. PVP **(pending)**

Rodeo – Medium-late maturity, high yield, good lodging resistance, fair test weight, high groat percentage, yellow seed. Susceptible to crown rust and smut, tolerant to red leaf. Selected at Ill. AES. Released in 1996. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(pending)**

Starter – Early maturity, lower yield, short, fair lodging resistance, medium test weight and groat percentage, medium protein percentage, yellow seed. Susceptible to crown rust and red leaf, resistant to smut. Selected at Minn. AES. Released in 1986. Well suited for companion cropping. PVP

Troy – Medium maturity, high yield, tall, poor lodging resistance, low test weight, medium groat percentage, white seed. Moderately susceptible to crown rust, resistant to smut and good tolerance to red leaf. Selected at S.D. AES. Released in 1991.

Whitestone – Late maturity, high yield, medium height, fair lodging resistance, high test weight and groat percentage, white seed. Resistant to crown rust and smut, some tolerance to red leaf. Selected at N.D. AES. Released in 1994. *Because of smut susceptibility, planting only treated seed is recommended.* PVP **(94)**

Oat Planting Rate and Date

Bushel Weight, Pounds	32
Seeds/Pound	16,200
Planting Rate, Pounds/Acre	80
Planting Rate, Seeds/Sq.Ft.	28
Planting Date	Early Spring

WHEAT Hard Red Spring

Spring wheat varieties are compared in replicated trial plots at Waseca, Lamberton, Morris, Crookston, Stephen, Roseau and St. Paul.

Only new varieties or varieties with better than susceptible reaction to scab are being tested. Variety descriptions do not provide information on scab resistance; table information should be used. Varieties are listed in maturity order. One hard white spring wheat, Argent, is also being tested.

Hard red spring wheat trials are not designed for crop (species) comparisons. Because the various crops are grown on different fields or with different management the data should only be used to compare varieties within a table.

Crop Background

The Minnesota Agricultural Experiment Station no longer makes recommendations for hard red spring wheat varieties. The basis on which recommendations were made in the past is no longer considered appropriate because of the severity of scab epidemics.

Scab epidemics in Minnesota's hard red spring wheat growing areas have demonstrated the clear need to give greater weight to selecting varieties for their tolerance to this devastating disease. Consequently, only newly released varieties, whose reaction to scab has not been well-documented, and older varieties with scab ratings better than susceptible, are tested and described. Scab evaluations provide *severity ratings*, based on visual spread of the disease on the spike, and *tolerance scores*, which reflect the variety's ability to maintain plump, sound kernels. These ratings should be considered together to reduce risk of loss. To reduce risk, the use of different seeding dates and of more than one variety to provide different days to heading is highly recommended.

Varieties

BacUp – Awned, very early, medium height. Resistant to stem rust, moderately susceptible to leaf rust. Low yield, very high test weight. Fair lodging resistance. Susceptible to foliar diseases. High tolerance to scab. Very high protein percent. Specialty variety release for scab tolerance with recommendation that it not be used on over 15% to 20% of acreage. Released by USDA-ARS and Minn. AES in 1996.

Forge – Awned, early, medium height. Moderately resistant to stem rust, moderately susceptible to leaf rust. High to medium yield, high test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1997. PVP **(pending)**

Ingot – Awned, early, tall. Resistant to stem rust, moderately susceptible to leaf rust. High to medium yield, very high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1998. PVP **(pending)**

Kulm – Awned, early, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by N.D. AES in 1994. PVP **(94)**

Oxen – Awned, early, semidwarf. Moderately resistant to stem rust, moderately susceptible to leaf rust. Very high yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1996. PVP **(94)**

Sharp – Awned, early, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium to high yield, high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1990.

Sharpshooter – Awned, early, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium yield and high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Similar to Sharp, selected from for possibly enhanced scab tolerance. Released by Western Plant Breeders in 1996. PVP **(pending)**

Ember – Awned, early-midseason maturity, medium height. Resistant to stem rust, moderately resistant to leaf rust. Medium to low yield and high test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Low to medium protein percent. Released by S.D. AES in 1999. PVP **(pending)**

Hamer – Awned, early-midseason maturity, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield and medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium to low protein percent. Released by AgriPro 1995. PVP **(94)**

2375 – Awned, early-midseason maturity, medium height. Resistant to stem rust, moderately susceptible to leaf rust. High to medium yield and test weight. Fair lodging resistance. Susceptible to foliar diseases. Tolerant to loose smut. Moderately susceptible to shattering. Medium protein percent. Released by Pioneer Hi-Bred in 1988. Sold by

Characteristics of hard red spring wheat varieties, 1997-1999.

Variety	Heading date	Height inches	Lodging 1=erect 9=flat	Test Weight, lb/bu	% Protein @ 12 % Moisture	Milling/ Baking Quality
BacUp	6-19	33	4.7	61.1	16.8	high
Forge	6-19	33	2.7	59.7	14.8	med
Ingot	6-19	35	3.4	61.3	15.2	high-med
Kulm	6-20	35	3.0	60.0	15.4	high-med
Oxen	6-20	31	3.3	58.3	15.0	med
Sharp	6-20	34	3.5	60.5	14.8	med
Sharpshooter	6-20	34	3.6	60.7	14.8	med
Ember[1]	6-21	33	4.1	59.7	14.2	med
Hamer	6-21	31	2.4	59.0	14.8	med-low
2375	6-22	32	4.7	59.6	14.6	med
Argent[2]	6-22	33	2.6	59.3	15.4	–
Parshall[2]	6-22	36	2.7	60.6	15.4	med-high
Russ	6-22	33	3.7	58.5	14.8	med
HJ98	6-23	31	4.3	57.8	14.4	med
Ivan[2]	6-23	30	2.0	58.8	13.9	med-low
Keene	6-23	37	3.5	58.9	15.2	med-high
Lars	6-23	28	2.4	57.5	14.0	med
Mercury	6-23	28	2.4	58.5	14.4	med
Nora	6-23	28	3.5	57.7	15.4	med
Norm[3]	6-23	31	2.2	57.7	14.1	med-high
NorPro	6-23	31	1.8	58.1	14.9	med
Reeder[1]	6-23	33	2.5	59.2	14.8	med-high
AC Barrie[2]	6-24	36	4.1	58.1	15.3	med
McVey	6-24	33	4.8	56.3	13.6	med-low
Verde	6-24	31	2.7	58.6	14.4	med-low
Gunner	6-25	34	2.9	59.6	15.9	med
Hagar	6-25	31	2.7	57.6	14.8	med
Marshall	6-26	30	1.8	56.9	14.3	med-low
Mean	6-22	32	3.3	58.8	14.9	
LSD	0.8	0.9	0.8	0.7	0.2	

[1] Data from 1999. [2] Data from 1998-1999. [3] Scab-susceptible check.

North Dakota State University Research Foundation 1990. **PVP (94)**

Argent – Hard white spring wheat, awned, early-midseason maturity, medium height. Resistant to stem rust, moderately susceptible to leaf rust. Medium to high yield and medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by N.D. AES in 1998. **PVP (pending)**

Parshall – Awned, early-midseason maturity, tall. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Good lodging resistance. Moderately resistant to foliar diseases. High protein percent. Released by N.D. AES in 1999. **PVP (pending)**

Russ – Awned, early-midseason maturity, medium height. Moderately resistant to stem rust and leaf rust. Medium to high yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by S.D. AES in 1995. **PVP (94)**

HJ98 – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield and medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. Medium to low percent protein. Released by Minn. AES and USDA-ARS in 1998. **PVP (94)**

Ivan – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield, medium test weight. Very good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Released by AgriPro in 1998. **PVP (pending)**

Keene – Awned, midseason, tall. Resistant to stem rust, moderately resistant to leaf rust. Medium yield and test weight. Fair lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by N.D. AES in 1997. **PVP (94)**

Disease susceptibility and tolerances of hard red spring wheat varieties, 1997-1999

	Leaf Rust[1]	Stem Rust[1]	Foliar Disease[1,2]	Scab Severity[1]	Scab Tolerance[3]
Variety					
BacUp	MS	R	S	MR	1.5
Forge	MS	MR	MS	MS-S	2.5
Ingot	MS	R	MS	MR-MS	2.0
Kulm	MR	R	MS	S-MS	2.5
Oxen	MS	MR	MS	MS-S	3.0
Sharp	MR	R	MS	MS-MR	2.5
Sharpshooter	MR	R	MS	MS-MR	2.5
Ember[4]	MR-MS	R	MS	MR	2.0
Hamer	MR	R	MR-R	MS-S	3.5
2375	MS	R	S	MS-MR	2.5
Argent[5]	MS	R	MS	MS-MR	2.5
Parshall[5]	MR	R	MR-R	MS-MR	2.0
Russ	MR	MR	MS	MS	3.0
HJ98	MR	R	MS	MS	3.0
Ivan[5]	MR	R	MR	S-MS	3.5
Keene	MR	R	MR	MS-MR	3.0
Lars	MR	R	MR	S	4.5
Mercury	MR	R	MR	S	5.0
Nora	MR	R	S	S	4.0
Norm[6]	R	R	MR-R	S	5.0
NorPro[1]	MR	–	MR	MS	3.5
Reeder[4]	MR	R	MR-R	MS	3.0
AC Barrie[5]	MS	R	MS	MS-MR	2.5
McVey	MR-MS	R	MR-MS	MR	3.0
Verde	MR	R	MR-R	MS	3.0
Gunner	MR-MS	R	MR	MR-MS	2.5
Hagar	MR	R	MS	S-MS	4.0
Marshall	MS	R	MS	MS-S	3.5

[1] R = resistant, MR = moderately resistant, MS = moderately susceptible, S = susceptible. [2] Ratings based on NDSU data from 1996-1998 and U of Minn. data from 1999. [3] Tolerance to maintain plump, sound kernels under scab epidemics: 1=very well, 2=well, 3=moderate, 4=fair, 5=poor. [4] Data from 1999. [5] Data from 1998-1999. [6] Scab-susceptible check.

Lars – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield, low test weight. Good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Released by AgriPro in 1995. PVP (94)

Mercury – Awned, midseason, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. High yield, medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium to low protein percent. Released by North Star Genetics in 1998.

Nora – Awned, midseason, semidwarf. Resistant to stem rust and moderately resistant to leaf rust. Medium to low yield and low to medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. High protein percent. Released by AgriPro in 1996. PVP (94)

Norm – Awned, midseason, semidwarf. Resistant to stem rust and to leaf rust. High yield, medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Low to medium protein percent. Included in trials as a scab susceptible check. Released by Minn. AES and USDA-ARS in 1992. PVP

NorPro – Awned, midseason, semidwarf. Moderately resistant to leaf rust. High yield, medium test weight. Very good lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by AgriPro in 1999. PVP **(pending)**

Reeder – Awned, midseason, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield and test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium protein percent. Released by N.D. AES in 1999. PVP **(pending)**

AC Barrie – Awnless, midseason-late, tall. Resistant to stem rust and moderately susceptible to leaf rust. Low yield, medium test weight. Fair lodging resistance. Moderately susceptible to foliar diseases. High to medium protein percent. Released by Agriculture and Agri-Food, Manitoba, Canada, to Cargill in 1997.

McVey – Awned, midseason-late maturity, medium height. Resistant to stem rust, moderately resistant to leaf rust. High yield, low test weight. Fair lodging resistance. Moderately resistant to foliar diseases. Low protein percent. Released by Minn. AES and USDA-ARS 1999. PVP **(pending)**

Verde – Awned, midseason-late maturity, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Very high yield, medium test weight. Good lodging resistance. Moderately resistant to foliar diseases. Medium to low protein percent. Released by Minn. AES and USDA-ARS in 1995. PVP (94)

Gunner – Awned, late, medium height. Resistant to stem rust , moderately resistant to leaf rust. Medium yield, high test weight. Good lodging resistance. Moderately resistant to foliar diseases. High protein percent. Released by AgriPro in 1996. PVP (94)

Yield (percent of the mean) of hard red spring wheat varieties, 1997-1999

	North				South				Average		
	Crookston[1]	Stephen	Roseau	On-Farm[2]	St. Paul[1]	Morris	Waseca	Lamberton	North	South	State
Variety											
BacUp	90	79	79	89	68	78	68	77	83	75	78
Forge	102	90	96	100	88	93	104	96	96	98	97
Ingot	100	98	97	105	99	115	112	106	100	111	106
Kulm	105	97	97	–	100	106	111	117	100	112	107
Oxen	110	103	111	122	109	120	109	115	109	117	114
Sharp	105	97	96	–	86	104	100	96	100	100	100
Sharpshooter	94	94	97	94	79	89	99	78	96	89	92
Ember[4]	82	92	99	90	102	64	104	85	91	88	89
Hamer	108	102	103	–	117	113	114	113	105	117	112
2375	108	108	106	107	99	99	96	96	109	99	103
Argent[3]	93	90	85	91	84	103	95	106	89	101	96
Parshall[3]	108	94	103	102	94	103	95	106	101	102	102
Russ	89	103	89	119	97	112	121	100	96	111	104
HJ98	112	116	108	101	107	104	104	105	114	107	110
Ivan[3]	122	112	117	125	127	118	111	111	117	117	117
Keene	82	92	93	89	92	92	97	105	92	99	96
Lars	111	106	104	125	124	113	108	105	108	113	111
Mercury	101	109	109	–	123	112	117	112	109	117	114
Nora	96	94	84	95	100	95	86	84	92	92	92
Norm[5]	101	96	108	–	106	101	102	114	103	108	106
NorPro[4]	103	108	97	–	113	104	109	117	103	110	107
Reeder[4]	91	90	95	109	113	118	109	116	92	114	105
AC Barrie[3]	77	78	77	69	79	82	74	81	78	80	79
McVey	102	120	113	108	100	101	106	103	115	105	109
Verde	104	105	115	107	114	100	111	118	110	112	111
Gunner	80	107	90	75	95	90	88	90	95	92	93
Hagar	95	92	110	88	101	91	87	89	101	93	96
Marshall	107	90	97	92	101	72	62	82	98	78	87
Mean (bu/acre)	42.2	47.1	48.9	48.0	40.0	54.0	43.4	45.8	45.9	45.4	45.6
LSD (0.05)	22	18	18	10	21	19	15	15	11	9	8

[1] Data from 1997 and 1999. [2] Data from 12 locations grown in Red River Valley in 1999, not included in North average. [3] Data from 1998 and 1999.
[4] Data from 1999. [5] Scab-susceptible check.

Hagar – Awned, late, semidwarf. Resistant to stem rust, moderately resistant to leaf rust. Medium yield and medium test weight. Good lodging resistance. Moderately susceptible to foliar diseases. Medium protein percent. Released by AgriPro in 1998. PVP (94)

Marshall – Awned, late, semidwarf. Resistant to stem rust, moderately susceptible to leaf rust. Medium to low yield and test weight. Very good lodging resistance. Moderately susceptible to foliar diseases. Low to medium protein percent. Released by Minn. AES and USDA-ARS in 1982. PVP

Hard Red Spring Wheat Planting Rate and Date

Calculating and seeding the appropriate amount of seed is an important first step towards maximizing yield. The seeding rate is a function of the number of kernels per pound of seed, the percent germination of the lot, the expected stand loss as a function of the quality of seedbed, and the desired stand. In Minnesota, an average optimum stand for hard red spring wheat when planted early is between 28 to 30 plants per square foot or approximately 1.25 million plants per acre. This number should increase by 1 to 2 plants per square foot for every week planting is delayed past the early, optimum seeding date. Expected stand loss even under good seedbed conditions is between 10% to 20% and will increase with a poor seedbed or improper seed placement due to poor depth control.

The general formula for calculating a seeding rate is:

$$\text{Seeding Rate (Pounds/Acre)} = \frac{\text{(Desired Stand in Plants/Acre) (1 + Expected Stand Loss)}}{\text{[(Seeds/Pound) (Percentage Germination)]}}$$

Calculate the seeding rate for every single seed lot and calibrate the drill accordingly.

Example: Early variety

Desired Stand (Plants/Acre)	Expected Stand Loss	Seeds per Pound	Percentage Germination	Seeding rate (Lb/Acre)
1.25 million	0.20	14,000	95	113

Winter Wheat

rop Background

Winter wheat varieties are tested in plicated trial plots at Morris, Rosemount, and Roseau; they are listed here order of heading. Only a limited mber of varieties are available. Two ars of testing is required before data is esented. Cultural practices have a ajor effect on winter survival of all nter wheat varieties. Planting into a m seedbed with some stubble remaing to retain snow cover can reduce winrkill.

arieties

ndem – Awned, medium height, early, ir lodging resistance. Moderate winrhardiness. Very long coleoptile. Retant to stem rust, susceptible to leaf st. High test weight, excellent quality. eleased by S.D. AES 1997. **(pending)**

indstar – Awned, semidwarf, early, od lodging resistance. Moderate winrhardiness. Short coleoptile. Moderateresistant to stem rust, moderately susptible to leaf rust. Medium test weight, tisfactory quality. Released by Neb. ES and USDA-ARS 1996. PVP **(94)**

apahoe – Awned, medium height, rly, fair lodging resistance. Moderate nterhardiness. Medium length leoptile. Resistant to stem rust and oderately resistant to leaf rust. Medin test weight, satisfactory quality. Reased by Neb. AES and USDA-ARS 88.

rimson – Awned, red-chaffed, medium ight, early-medium maturity, very od lodging resistance. Moderate winhardiness. Very long coleoptile. oderately resistant to stem rust, susptible to leaf rust. Moderate resistance Septoria tritici blotch. High test ight, good quality. Released by D. AES 1997. PVP **(pending)**

nsom – Awned, medium height, rly-medium maturity, fair lodging retance. Moderately high winterhardiss. Resistant to stem rust, moderately istant to leaf rust. Medium test weight, satisfactory quality. Released by N.D. AES 1998. PVP **(pending)**

Roughrider – Awned, tall, medium maturity, fair lodging resistance. Very high winterhardiness. Very long coleoptile. Resistant to stem rust but susceptible to leaf rust. High test weight, excellent quality. Released by N.D. AES 1975.

Elkhorn – Awned, tall, medium-late, fair lodging resistance. High winterhardiness. Long coleoptile. Resistant to stem rust, moderately susceptible to leaf rust. Medium test weight, good quality. Released by N.D. AES 1995.

Seward – Awned, tall, medium-late, good lodging resistance. Moderately high winterhardiness. Long coleoptile. Resistant to stem rust, susceptible to leaf rust. Medium test weight, satisfactory quality. Released by N.D. AES 1987.

Growth characteristics of publicly developed winter wheat varieties, 1998-1999.

	Heading Date	Height, Inches	Hardiness [1]	Lodging, 1 = erect 9 = flat	Rust Resistance [2] Leaf	Stem
Variety						
Tandem	6-2	38	M	5.3	S	R
Windstar	6-3	35	M	3.3	MR-MS	MR
Arapahoe	6-4	35	M	4.5	MR	R
Crimson	6-4	39	M	2.8	S	MR
Ransom	6-4	40	MH	4.8	MR	R
Roughrider	6-5	42	VH	5	S	R
Elkhorn	6-7	42	H	4.8	MS	R
Seward	6-7	41	MH	5	S	R
Mean	6-4	39		4.4		
LSD (0.05)	2.2	3.1		2.6		

[1] Winterhardiness rating is a relative ranking that includes data from North Dakota, Nebraska and South Dakota: VH=very high, H=high, MH=moderately high, M=moderate.
[2] R=resistant, MR=moderately resistant, MS=moderately susceptible, S=susceptible.

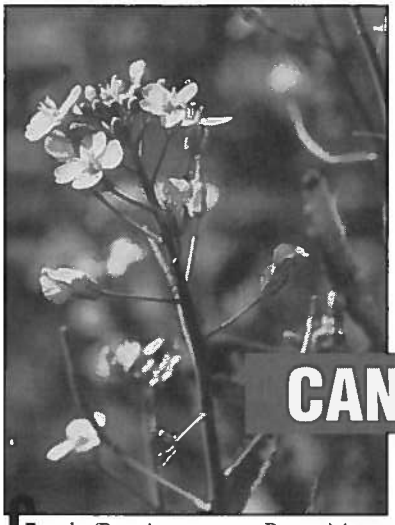
Yield (percent of the mean) and characteristics of publicly developed winter wheat varieties, 1996, 1998, 1999.

	Test Wt [1], lb/bu	% Protein @ 12% Moisture [1]	Yield (percent of the mean) Rosemount	Morris [2]	Roseau [1]	Average
Variety						
Tandem	59.2	13.5	99	101	108	102
Windstar	57.6	12.6	105	106	122	112
Arapahoe [3]	56.7	13.2	94	90	125	98
Crimson	59.0	13.1	109	104	91	102
Ransom	57.5	13.3	78	87	101	88
Roughrider	58.7	13.1	99	100	91	97
Elkhorn	57.7	13.6	112	118	99	110
Seward	58.2	12.3	107	91	101	101
Mean	58.1	13.1	56.2 bu/acre	57.9 bu/acre	39.4 bu/acre	51.9 bu/acre
LSD (0.05)	1.3	0.6	25.1	NS	20.0	15.5

[1] Data from 1998-1999. [2] Data from 1996 and 1998. [3] Arapahoe not grown at Roseau in 1998.

Hard Red Winter Wheat Planting Rate and Date

Pounds/Bushel
Bushel Weight.....60
Seeds/pound.....14,500
Pounds Rate/acre.....75+
Seeds / Square Foot.....25
Planting Date.....Aug. 20 - Sept. 20



CANOLA

Canola (Brassica napus or B. rapa) is a crop developed from oilseed rape by Canadian plant breeders; the first canola variety was licensed in 1974. Canola is used for edible oil extraction and protein feed meal. Canola oil is considered one of the highest quality edible oils available. Considerable acreage of spring canola is grown in Canada. Interest in spring canola has increased recently in Minnesota, where the acreage grown has increased from about 8,000 acres in 1990 to more than 200,000 acres in 1998.

The oil in canola seed contains less than 2 percent erucic acid. This compares with the 20 to 40 percent level of erucic acid found in oilseed rape. The meal remaining after oil extraction contains less than 0.1 percent of glucosinolate (sulfur-containing compounds) compared with about 1 percent in rapeseed meal. High levels of erucic acid in food oils are hazardous to health, and high levels of glucosinolates are detrimental in livestock feeds. Consequently, canola is also referred to as "double low" or "00" rapeseed.

The canola varieties described here are all spring-sown *Brassica napus* types. Winter canola varieties were previously evaluated by University of Minnesota researchers at locations throughout the state. In trials over 15 year/locations, fewer than 30 percent of the trials successfully overwintered.

Production information is provided in the canola chapter of the Alternative Field Crops Manual, which is available for $45 from county extension educators or the Center for Alternative Plant & Animal Products, 352 Alderman Hall, University of Minnesota, St. Paul, MN 55108. Either source can provide more information about this publication.

The more complete Canola Growers Manual on canola production is available from the Canola Council of Canada, 400-167 Lombard Ave, Winnipeg, Manitoba, Canada R3B 0T6 (phone 204-982-2100, internet www.canola-council.org). It contains detailed information on canola production practices and costs $68.00 (U.S.). The Canola Council also provides free annual updates to keep the information in the manual current. Please keep in mind if using this manual that not all pesticides used in Canada are legal in the United States. Always confirm the clearance of a pesticide with your local dealer or county extension educator.

The Minnesota Canola Council, (see page 32) is another source for information on canola.

Canola Variety Name Changes

Old Name or Experiment Number	New Variety Name
EXP95-09	1709
Hy 2	Blueribbon
5152.072	CL2061
9702	Cracker Jack
HCN 35	Phoenix
94-22685NDA	Q-2
SW 02766	Senator
SW 02601	SW Arrow
ZSNA005	Z005
Hyola EXP1RR	Hyola 357RR

The Crookston testing site was on the Monte Casavan farm. At Fosston the testing site was on the Ron Landsverk farm. The Kennedy testing site was on the Rob and Tim Rynning farm, and at Roseau the testing site was on the Richard Magnusson farm.

Support for the Kennedy site was provide by Cenex-Harvest States of Kennedy

General assistance for field work was provided by county extension educators Vicent W. Crary, Nathan L. Johnson, Herman J. Kendel, Gene Krause, Curtis W. Nyegaard and Joseph Shafer.

Locations of canola trials

Canola seed sources for 2000 planting, keyed to "Variety Information" column in seed yield tables, pages 60-61 and 66.

Developers

D1 Agrevo, 203-407 Downey Rd., Saskatoon, Saskatchewan, Canada S7N 3R2

D2 Agriprogress, P.O. Box 2499, Morden, Manitoba,Canada R6M 1C2

D3 Brett Young, Box 99, St. Nobert P.S., Winnipeg, Manitoba, Canada

D4 Cargill Hybrid Seeds, P.O. Box 5645, Minneapolis, MN 55440

D5 Croplan Genetics, P.O. Box 1291, Minot ND 58702

D6 Danisco Seed, Mariba Seeds, Copenhagen, Denmark

D7 DLF, Trifolium, Germany

D8 DSV-Deutszhe Saatveredelung, Germany

D9 InterMountain Canola, 2300 N. Yellowstone Hwy, Suite 122,, Idaho Falls, ID 83401

D10 Limagrain, P.O. Box 250, Listowel,, Ontario, Canada N4W 3H2

D11 Mycogen, 1340 Corporate Center Curve, Eagan, Mn. 55121

D12 No Information Available

D13 NPZ, Germany

D14 Pioneer Hi-Bred International, 720 S. 48th St., Grand Forks, ND 58201

D15 Svalof Weibull Seed, P.O. Box 217, Lindsay, Ontario, Canada K9V 5Z4

D16 University of Alberta/Agricore, 505-2nd St. SW., Box 2700, Calgary, Alberta, Canada T2P ZP5

D17 University of Guelph, Guelph, Ontario, Canada

D18 Zenneca, Winnipeg, MB, Canada

Marketers

M1 AgrEvo, 203-407 Downy Rd.,Saskatoon, Saskatchewan, Canada S7N 3R2 , 306-477-9427

M2 Agriprogress, P.O. Box 2499, Morden, Manitoba, Canada R6M 1C2, 204-822-4956

M3 Agri-Tel Grain LTD, Box 808, Beausejour, Manitoba, Canada R0E 0C0, 204-268-1415

M4 Bonis & Co., P.O. Box 217, Lindsay, Ontario, Canada K9V 5Z4, 704-324-3293

M5 Brett Young Seed LTD, Box 99, St. Nobert P.S., Winnipeg, Manitoba, Canada R3Y IG4, 204-261-7932

M6 Canterra Seeds Ltd., 43 Scurfield Blvd., Winnipeg, Manitoba, Canada R3Y 1G4, 204-988-9750

M7 Cargill Hybrid Seeds, P.O. Box 5645, Minneapolis, MN 55440, 612-742-6731

M8 Croplan Genetics, P.O. Box 1291, Minot, ND 58702, 701-852-3556

M9 Integra Seed, P.O. Box 40, Bozeman, MT 59771-0040, 406-582-8375

M10 InterMountain Canola, 2300 N. Yellowstone Hwy, Suite 122, Idaho Falls, ID 83401, 208-522-4113

M11 Interstate Seed Co., 1215 Prairie Parkway, West Fargo, ND 58078, 800-437-4120

M12 Kaystar Seed, P.O. Box 947, Huron, SD 57350, 605-352-8791

M13 Limagrain, P.O. Box 250, Listowel, Ontario, Canada N4W 3H2, 306-249-4220

M14 Mycogen, 1340 Corporate Center Curve, Eagan, MN 55121, 651-405-5800

M15 Newfield Seeds/Promark, Box 100 Nipawin, Saskatchewan, Canada S0E1E0, 306-862-4678

M16 No Information Available

M17 Performance Seeds, Box 35028, Regina, Saskatchewan, Canada S4X 4C6, 306-791-0550

M18 Pioneer Hi-Bred International, 720 S. 48th St., Grand Forks, ND 58201, 701-775-2546

M19 Proseed, 705 E. Brewster, Harvey, ND 58341, 701-324-4177

M20 Seeds 2000, PO Box 101, Breckenridge, MN 56520, 218-643-1208

Seed yield of canola (Brassica napus) varieties, lb/acre at 8 % moisture, at Roseau, Kennedy, Fosston, and Morris, 1999.

Variety information includes Source Codes: (D = developer; M = marketer) keyed to listing, page 59, and these supplemental codes: H = Hybrid, Imi = Imidazalanone Tolerant, SP = Specialty Oil, Op = Open Pollinated, LL = Liberty Link, Syn = Synthetic, RR = Roundup Ready Check.
Blackleg Resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, N/A = Ratings Not Available. **Long-term average** of Hyola 401 (1993-99) is 1,980 lb/acre. **Varieties in bold** are Conventional and Roundup Ready* checks. ** **Hudson** sat in the swath 4 weeks (5-10 days longer than the other treatments) which likely contributed to the high level of shattering. The Hudson yields were adjusted for shatter loss prior to statistical ananlysis.

Variety	Variety Information	Blackleg Resistance	Roseau	Kennedy	Fosston	R-K-F Average	Morris	Roseau, 1998-99
1709	D11,M14, Op	R	1,578	–	–	–	–	2,026
45A03	D14,M18, Op	MR	1,579	1,815	917	1,437	–	–
45A51*	D14,M18, Op,RR	MR	1,610	1,980	1,425	1,672	1,146	–
45A71	D14,M18, Op,Imi.	MR	1,685	2,058	–	–	–	1,700
46A65	D14,M18, Op	MR	1,765	2,060	1,728	1,851	–	1,959
46A76	D14,M18, Op,Imi.	MR	1,597	2,249	–	–	–	–
91-15026 NA	D16,M11, Op, Sp	R	1,618	2,144	–	–	–	2,144
93-KK51004	D9,M10, Op	MS	1,725	–	–	–	–	–
93NE.1439	D9,M10, Op	MS	1,237	–	–	–	–	–
96-2367LL	D8,M5, Op,LL	MR	1,506	2,043	–	–	–	–
96-2393LL	D8,M5, Op,LL	MR	1,802	2,180	–	–	–	–
Advantage	D7,M9, Op	MR	1,300	–	–	–	–	1,833
Battleford	D15,M9, Op	MR	1,710	–	–	–	–	231
Blue Ribbon	D7,M19, H	MR	1,501	–	1,480	–	–	2,022
Canterra1134	D10,M6, Op	MS	1,361	–	–	–	–	–
Canterra1492	D2,M6, H	MR	1,911	–	–	–	–	–
Canterra1174	D10,M6, Op	MS	1,868	–	–	–	–	–
Cavalier	D12,M7, Op	MR	1,354	1,950	1,318	1,541	–	1,533
CL2070	D5,M8, H	MR	1,706	2,204	1,263	1,724	1,307	2,111
CL2078	D5,M8, Syn	MR	1,774	2,217	1,390	1,794	1,157	2,189
CrackerJack	D15,M9, Syn	MR	1,811	2,352	–	–	–	2,286
Crusher	D15,M11, Op	MS	1,465	1,996	1,336	1,599	1,216	1,979
DMS-100	D11,M14, Op	MR	1,340	–	–	–	–	1,728
DP7-97	D7,M19, Op	MR	1,883	2,254	1,463	1,867	1,300	–
DS1-9220	D6,M2, Op	MS	1,621	–	–	–	–	–
Eagle	D15,M9, Op	MR	1,440	–	–	–	–	1,785
Ebony	D10,M13, Op	MR	1,481	2,272	1,527	1,760	1,112	2,083
Golden Boy	D15,M20, Syn.	MR	1,624	2,085	1,454	1,721	–	1,954
Goldpro 701	D15,M15, H	MR	1,859	2,045	–	–	–	2,011
HCN 41	D1,M1, Op,LL	MS	1,617	1,905	1,392	1,638	1,475	–
Hudson	D5,M8, Op	MR	1,660	1,925	1,514**	1,700	1,032	1,703
Hyola 330	D18,M11, H	MS	1,837	2,062	1,483	1,794	–	1,974
Hyola 401	D18,M11, H	S	1,894	2,036	1,645	1,858	1,529	2,098
Hyola 420	D18,M11, H	MR	1,738	2,187	1,498	1,808	–	1,906
IMC-140	D9,M10, Op	MS	1,471	–	–	–	–	1,585
InVigor2363	D1,M1, H,LL	MS	1,761	2,158	1,728	1,882	1,563	–
InVigor2373	D1,M1, H,LL	MS	1,684	2,490	1,478	1,884	1,360	–
KC-701	D12,M12, H	MR	1,746	2,157	–	–	–	2,260
LG3222	D10,M13, Op	MS	1,612	1,852	–	–	–	1,856
LG3295*	D10,M13, Op,RR	MR	1,529	1,886	1,414	1,610	1,023	–
LG3333	D10,M13, Op	MR	–	2,105	1,369	–	1,333	–
LG3369	D10,M13, Op	MR	–	–	1,150	–	1,234	–
LG3930	D10,M13, Op	MR	1,149	1,821	–	–	–	1,631
M94S007	D11,M14, Op	MS	1,549	–	–	–	–	–
M94S010	D11,M14, Op	MS	1,665	–	–	–	–	–
OAC Summit	D17,M3, Op	MS	–	–	1,751	–	–	–
Oscar	D5,M8, Op	MR	1,439	2,112	861	1,471	1,184	1,912

Variety	Variety Information	Blackleg Resistance	Roseau	Kennedy	Fosston	R-K-F Average	Morris	Roseau, 1998-99
PF8414/96	D8,M2, H	MS	1,792	–	–	–	–	2,132
Phoenix	D1,M1, Op,LL	MS	1,315	1,948	1,104	1,456	1,138	–
PHS98-596	D1,M1, H,LL	N/A	2,023	2,338	1,708	2,023	1,306	–
PHS98-601	D1,M1, H,LL	N/A	1,831	2,577	1,603	2,004	1,378	–
PHS98-639	D1,M1, H,LL	N/A	1,950	2,410	1,784	2,048	1,423	–
PHS98-685	D1,M1, H,LL	N/A	1,816	2,246	1,632	1,898	1,207	–
PHS98-730	D1,M1, H,LL	N/A	1,656	2,167	1,484	1,769	1,101	–
PR 5227-1	D10,M13, Op	R	1,649	2,041	–	–	–	–
PR 5269	D10,M13, Op	R	1,606	1,937	–	–	1,379	–
PR 5271	D10,M13, Op	R	1,756	2,144	–	–	–	–
Promark220	D15,M15, Syn.	MR	1,699	–	1,620	–	–	2,099
Q-2	D16,M16, Op	R	1,664	2,096	1,307	1,689	–	1,872
Quest*	D16,M11, Op,RR	MR	1,564	1,792	1,187	1,514	1,025	–
Roseau	D12,M7, Op	MR	1,445	1,747	913	1,368	–	1,913
Senator	D15,M4, Op	MR	1,856	2,304	–	–	–	2,313
SV095-08	D11,M14, Op	MR	1,778	–	–	–	–	2,155
SW B2691	D15,M4, Op	MR	1,759	2,061	–	–	–	–
SW B2696 LL	D15,M4, Op,LL	MS	1,809	1,924	–	–	–	–
SW B5001	D15,M4, H	MR	2,095	2,138	–	–	–	–
Topscore	D7,M19, Op	MR	1,557	1,926	1,287	1,590	1,378	1,801
Z009	D18,M11, Op	MR	1,833	2,021	1,138	1,664	–	–
Mean			1,656	2,090	1,410	1,721	2,090	–
LSD (0.05)			242.8	237.4	191.8	150.1	237.4	–
C.V.			10.5	8.1	9.7	10.9	8.1	

Growth characteristics and oil content of canola varieties grown near Roseau, planted June 18, 1999.

Varieties in bold are Conventional and Roundup Ready* checks

** Note: Maturity DAP over 102 are projected estimates because the plots were cut prematurely on September 28 to allow drying time to combine before winter.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
1709	1,578	39.2	31	40	100	52	2.8	5
45A03	1,579	37.7	30	39	98	49	2.8	7
45A51*	1,610	39.0	32	40	99	51	2.5	6
45A71	1,685	36.6	28	39	99	53	4.3	6
46A65	1,765	38.8	31	39	99	52	4.0	5
46A76	1,597	39.0	31	41	101	56	3.0	6
91-15026NA	1,618	39.9	31	43	105**	58	1.3	4
93-KK51004	1,725	38.0	29	39	95	49	5.3	7
93NE.1439	1,237	36.7	33	39	97	49	4.0	4
96-2367LL	1,506	39.2	33	40	102	60	3.0	7
96-2393LL	1,802	38.3	30	39	100	53	4.0	10
Advantage	1,300	38.2	31	40	102	59	3.0	6
Battleford	1,710	37.6	31	39	100	54	3.5	8
BlueRibbon	1,501	40.6	29	42	106	61	2.3	6
Canterra 1134	1,361	38.7	32	40	99	53	3.8	6
Canterra 1174	1,868	38.4	29	40	99	53	3.5	8
Canterra 1492	1,911	39.7	29	38	98	51	3.0	7
Cavalier	1,354	38.6	31	39	95	47	4.3	5
CL2070	1,706	38.2	29	40	104**	58	2.8	6
CL2078	1,774	38.0	29	40	101	54	2.8	8
CrackerJack	1,811	38.5	29	39	100	54	2.3	7

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
Crusher	1,465	38.2	32	42	102	57	2.3	5
DMS-100	1,340	38.7	33	41	103	53	4.3	6
DP7-97	1,883	37.5	30	39	100	53	2.0	7
DS1-9220	1,621	40.9	31	40	102	53	3.5	7
Eagle	1,440	36.4	33	39	99	47	3.0	6
Ebony	1,481	40.4	32	42	102	59	2.0	3
GoldenBoy	1,624	38.5	32	41	101	55	2.8	4
Goldpro701	1,859	38.5	29	37	101	54	2.8	7
HCN 41	1,617	38.3	31	40	99	49	3.0	4
Hudson	1,660	36.0	28	36	92	50	4.5	7
Hyola 330	1,837	37.2	30	36	94	39	5.0	5
Hyola 401	1,894	37.3	28	38	97	45	3.3	6
Hyola 420	1,738	37.0	29	38	98	47	3.8	7
IMC-140	1,471	40.5	31	41	101	53	4.3	5
InVigor 2363	1,761	37.8	30	40	98	56	2.5	6
InVigor 2373	1,684	38.7	28	40	97	53	3.5	6
KC-701	1,746	39.0	29	40	102	55	2.8	6
LG 3222	1,612	40.4	32	39	99	51	3.3	7
LG 3295*	1,529	36.6	30	40	97	51	4.5	10
LG 3930	1,149	41.7	32	41	103	57	3.8	5
M94S007	1,549	41.5	30	41	101	52	2.8	5
M94S010	1,665	40.8	32	39	99	44	3.3	8
Oscar	1,439	33.2	29	41	99	53	2.5	6
PF8414/96	1,792	38.0	29	40	99	53	2.8	6
Phoenix	1,315	41.2	34	41	100	52	3.3	6
PHS98-596	2,023	41.4	28	40	100	53	3.8	6
PHS98-601	1,831	38.5	31	41	102	53	3.3	4
PHS98-639	1,950	38.1	29	41	99	56	3.3	6
PHS98-685	1,816	35.4	30	41	99	54	3.0	8
PHS98-730	1,656	37.9	30	37	91	46	5.0	6
PR 5227-1	1,649	38.6	30	40	101	55	3.0	5
PR 5269	1,606	38.4	30	38	100	49	3.3	6
PR 5271	1,756	39.5	30	37	98	50	4.3	6
Promark220	1,699	37.7	30	40	102	55	2.5	6
Q 2	1,664	36.6	30	40	98	55	2.8	7
Quest*	1,564	37.2	31	38	97	49	5.0	9
Roseau	1,445	37.4	32	38	97	50	2.3	4
Senator	1,856	39.7	31	40	101	56	2.8	4
Summit	1,764	37.6	31	42	98	56	3.8	8
SV095-08	1,778	37.8	30	41	102	56	2.8	6
SW B2691	1,759	37.5	29	39	100	55	2.3	9
SW B2696LL	1,809	37.8	30	40	97	50	3.3	6
SW B5001	2,095	38.2	30	39	100	54	2.0	4
Topscore	1,557	36.4	32	40	100	57	2.8	7
Z009	1,833	38.9	31	40	99	54	4.0	4
Mean	1,656	38.4	30	40	99	53	3.2	6.0
LSD (0.05)	242.8	1.10	2.3	0.9	2.9	3.7	1.04	3.36
C.V.	10.5	2.1	5.6	1.7	2.1	5.0	23.0	40.1

Growth characteristics and oil content of canola varieties grown near Fosston, planted May 29, 1999.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Shatter, %
** Hudson sat in the swath 4 weeks (5-10 days longer than the other treatments) which likely contributed to the high level of shattering. The Hudson yields were adjusted for shatter loss prior to statistical ananlysis.								
45A03	917	38.4	28	41	87	49	3.0	1.0
45A51*	1,425	36.8	28	41	89	52	3.3	1.0
46A65	1,728	38.9	28	40	89	48	3.3	0.5
BlueRibbon	1,480	36.9	26	47	93	58	2.0	2.0
Cavalier	1,318	34.7	26	41	88	49	4.8	1.0
CL2070	1,263	35.8	26	43	91	57	3.0	1.5
CL2078	1,390	38.8	26	42	89	52	2.8	1.0
Crusher	1,336	37.1	30	43	91	55	2.3	0.5
DP7-97	1,463	37.3	27	41	90	49	2.0	1.5
Ebony	1,527	37.0	27	44	91	56	2.5	0.5
Golden Boy	1,454	37.2	27	41	89	52	2.5	0.5
HCN 41	1,392	37.5	27	42	88	54	3.0	1.0
Hudson	1,514**	37.1	26	37	81	48	2.8	7.9 **
Hyola 330	1,483	36.5	25	38	86	47	3.3	0.5
Hyola 401	1,645	37.0	25	40	91	51	3.0	0.5
Hyola 420	1,498	36.5	25	40	90	51	3.5	0.5
InVigor 2363	1,728	38.5	25	43	89	55	3.0	1.0
InVigor 2373	1,478	37.1	26	33	90	56	3.0	0.5
LG 3295*	1,414	36.0	26	41	89	53	5.5	0.5
LG 3333	1,369	37.2	27	38	88	52	3.3	2.0
LG 3369	1,150	38.8	27	40	90	54	3.8	1.0
OAC Summit	1,751	36.1	26	43	91	58	4.3	0.0
Oscar	861	31.8	27	42	89	51	2.5	0.0
Phoenix	1,104	40.2	27	41	89	51	5.0	1.0
PHS98-59	1,708	39.5	26	43	91	56	3.5	2.0
PHS98-60	1,603	36.8	26	43	92	54	3.8	1.0
PHS98-63	1,784	37.5	25	43	90	56	3.5	1.0
PHS98-68	1,632	35.2	26	40	88	51	3.0	0.0
PHS98-73	1,484	39.7	26	39	87	52	4.0	1.0
Promark 220	1,620	38.0	27	41	89	53	2.3	1.0
Q2	1,307	36.6	26	41	88	54	3.8	0.0
Quest*	1,187	37.6	27	38	87	50	3.8	1.0
Roseau	913	37.5	27	40	88	49	2.8	1.0
Topscore	1,287	36.7	29	42	90	55	2.8	2.0
Z009	1,138	37.2	27	43	90	52	5.3	1.5
Mean	1,410	37.2	26	41	89	52	3.3	1.1
LSD (0.05)	192	1.24	1.3	4.9	2.3	4.5	1.10	0.88
C.V.	10	2.4	3.4	8.5	1.9	6.1	23.8	57.2

Growth characteristics and oil content of canola varieties grown near Kennedy, planted April 29, 1999.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
45A03	1815	35.9	45	53	95	39	1.3	16
45A51*	1980	36.0	44	54	98	42	2.5	19
45A71	2058	34.5	43	53	95	41	3.3	17
46A65	2060	36.0	43	53	97	41	2.5	14
46A76	2249	35.5	43	55	101	48	1.0	8

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To 95% Canopy Closure	Plot at 10% Bloom	Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
91-15026NA	2144	32.2	43	54	99	48	1.8	11
96-2367LL	2043	36.8	44	54	101	50	2.0	13
96-2393LL	2180	36.7	42	54	101	49	2.3	14
Cavalier	1950	35.7	44	54	94	38	2.3	19
CL2070	2204	35.7	42	54	101	47	2.0	11
CL2078	2217	35.1	42	54	101	46	1.8	13
Cracker Jack	2352	35.7	43	54	100	46	1.5	11
Crusher	1996	35.5	45	56	100	47	1.5	11
DP7-97	2254	37.2	43	53	101	47	1.0	13
Ebony	2272	37.2	42	54	101	45	2.0	9
GoldenBoy	2085	35.1	42	53	99	46	2.3	15
Goldpro 701	2045	36.0	42	53	98	48	1.5	12
HCN 41	1905	34.9	43	54	96	43	2.5	13
Hudson	1925	34.9	42	52	94	40	1.5	21
Hyola 330	2062	35.6	41	50	93	34	2.3	19
Hyola 401	2036	35.6	42	50	96	34	2.5	13
Hyola 420	2187	35.4	42	52	96	38	2.3	13
InVigor 2363	2158	35.6	42	54	97	44	3.0	12
InVigor 2373	2,490	36.2	42	54	98	47	2.8	11
KC-701	2,157	36.2	42	53	100	44	1.8	11
LG3222	1,852	36.6	43	53	99	40	2.3	15
LG3295*	1,886	34.5	42	53	95	41	3.8	24
LG3333	2,105	35.1	42	52	96	41	2.5	19
LG3930	1,821	36.9	46	54	102	41	3.0	10
Oscar	2,112	31.3	43	53	100	43	1.8	10
Phoenix	1,948	36.5	43	54	100	42	2.8	16
PHS98-596	2,338	38.5	41	54	99	47	2.8	10
PHS98-601	2,577	38.3	42	55	101	47	2.3	11
PHS98-639	2,410	34.7	41	54	97	49	2.0	11
PHS98-685	2,246	35.1	41	54	97	46	3.3	13
PHS98-730	2,167	34.4	41	52	95	43	2.8	12
PR5227-1	2,041	34.4	43	54	98	46	1.8	12
PR5269	1,937	36.0	43	53	96	42	1.8	18
PR5271	2,144	36.3	43	52	97	41	1.8	11
Q2	2,096	33.5	41	54	96	45	2.8	15
Quest*	1,792	35.7	43	52	99	43	3.3	14
Roseau	1,747	36.2	44	53	95	39	1.8	15
Senator	2,304	38.1	42	54	101	50	1.8	9
SW B2691	2,061	35.7	41	53	96	46	1.5	15
SW B2696LL	1,924	34.1	43	54	94	43	2.8	19
SW B5001	2,138	36.3	42	54	98	48	1.5	8
Topscore	1,926	35.0	44	54	99	47	2.8	11
Z009	2,021	35.4	42	53	95	43	3.3	19
Mean	2,090	35.6	42	53	98	44	2.2	14
LSD (0.05)	237.4	1.20	1.6	0.9	2.4	3.7	0.78	7.0
C.V.	8.1	2.4	2.7	1.2	1.8	6.1	25.1	37.0

Growth characteristics and oil content of canola varieties grown near Morris, planted April 30, 1999.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
45A51*	1,146	33.7	48	87	52	8.0	13
CL2070	1,307	33.7	50	88	53	5.5	2
CL2078	1,157	32.7	49	87	52	5.5	1
Crusher	1,216	32.5	52	88	55	2.0	1
DP7-97	1,300	34.0	48	89	53	7.0	6
Ebony	1,112	33.9	51	90	55	4.5	1
HCN 41	1,475	32.3	48	87	57	5.5	1
Hudson	1,032	33.5	45	84	50	7.0	10
Hyola 401	1,529	34.2	45	87	45	7.5	2
InVigor 2363	1,563	33.5	48	87	55	7.0	6
InVigor 2373	1,360	33.8	49	89	56	7.0	5
LG 3295*	1,023	32.0	48	87	54	8.0	23
LG 3333	1,333	33.6	45	86	53	7.5	5
LG 3369	1,234	34.3	47	89	54	7.5	5
Oscar	1,184	28.7	47	87	49	6.0	1
Phoenix	1,138	35.6	49	89	50	7.0	2
PHS98-596	1,306	36.5	49	88	61	8.0	6
PHS98-601	1,378	35.8	50	89	57	6.0	3
PHS98-639	1,423	33.5	48	87	58	6.5	5
PHS98-685	1,207	32.9	47	87	55	7.5	11
PHS98-730	1,101	33.2	46	86	56	7.5	4
PR 5269	1,379	33.7	46	87	52	7.5	4
Quest*	1,025	34.1	46	88	53	8.0	7
Topscore	1,378	31.7	48	87	54	7.0	5
Mean	1,258	33.5	48	87	54	6.7	5
LSD (0.05)	267	1.69	1.5	1.7	4.9	1.75	10.4
C.V.	15	3.6	2.3	1.4	6.4	18.6	142.7

Seed yield of Roundup Ready canola (Brassica napus) varieties, lb/acre at 8% moisture at Roseau, Fosston and Kennedy 1999 and Kennedy 1998.

Variety information includes Source Codes: (D# = developer; M# = marketer) keyed to listing, page 59, and these Supplemental codes: H = Hybrid, SP = Specialty Oil, Op = Open Pollinated, Syn = Synthetic.

Blackleg Resistance rating provided by seed companies: R = Resistant, MR = Moderately Resistant, MS = Moderately Susceptible, S = Susceptible, N/A = Ratings Not Available

***1998 Roundup Ready results** which were not published for the 17 varieties test. The seven varieties that show yields were tested in 1998 and 1999 at Kennedy.

Variety	Variety Information	Blackleg Resistance	Roseau	Roseau - Kennedy Kennedy	Roseau - Kennedy Average	Fosston	Kennedy, 1998*	Kennedy, 1998-99
449RR	D8,M5, H	MS	1,366	1,959	1,663	–	–	–
4992.125	D6,M16, H	MS	1,473	–	–	–	–	–
5152.098	D6,M16, H	MS	1,539	–	–	–	–	–
5153.104	D6,M16, H	MS	1,567	–	–	–	–	–
45A51*	D14,M18, H	MR	1,555	2,139	1,847	1,423	2,224	2,182
46A52	D14,M18, Op	MR	1,355	1,863	1,609	–	–	–
561RR	D8,M5, Op	R	1,378	1,770	1,574	–	–	–
A 98-9NR	D16,M11, Op, SP	R	1,711	1,927	1,819	–	–	–
A4992.125	D6,M16, Op	MS	1,367	–	–	–	–	–
A5152.098	D6,M16, Op	MS	1,549	–	–	–	–	–
A5153.104	D6,M16, Op	MS	1,631	–	–	–	–	–
Arrow	D15,M11, Op	R	1,383	1,721	1,552	917	1,916	1,819
CL2061	D6,M8, H	MR	1,732	–	–	–	–	–
GoldnRdyRR	D10,M20, Op	S	1,700	2,232	1,966	1,438	–	–
Hyola 357	D18,M11, H	MR	1,652	2,114	1,883	1,613	2,348	2,231
IMC-203	D9,M10, Op	MS	1,434	–	–	–	–	–
LG 3235	D10,D13, Op	MR	1,497	1,934	1,716	1,539	–	–
LG 3275	D10,D13, Op	MR	1,494	1,846	1,670	1,323	–	–
LG 3295*	D10,D13, Op	MS	1,462	1,959	1,711	1,436	2,107	2,033
LG 3345	D10,M13, Op	MR	1,524	–	–	1,366	–	–
Minot	D5,M8, Op	MR	1,574	2,065	1,820	1,541	–	–
PR 3665	D10,M13, Op	MR	1,622	1,912	1,767	1,361	2,220	2,066
PR 5292	D10,M13, Op	MR	1,425	1,879	1,652	1,522	1,966	1,923
PR 5296	D10,M13, Op	MR	1,603	2,214	1,909	1,268	–	–
Quest*	D16,M11, Op	MR	1,506	1,782	1,644	1,358	2,017	1,900
SW B2674RR	D15,M4, Syn	MR	1,561	2,123	1,842	–	–	–
SW B2675RR	D15,M4, Op	MR	1,475	1,794	1,635	–	–	–
SW B2677RR	D15,M4, Syn	MR	1,377	2,121	1,749	–	–	–
SW RideR	D15,M11, Syn	MR	1,717	–	–	1,293	–	–
SWRaideRR	D15,M9, Op	MR	1,707	2,125	1,916	–	–	–
Mean			1,531	1,980	1,747	1,980	2,133	–
LSD (0.05)			220.5	282.7	182.2	282.7	257.3	–
C.V.			10.2	10.1	10.5	10.1	8.7	–

Growth characteristics and oil content of Roundup Ready canola varieties grown near Roseau, planted June 18, 1999.

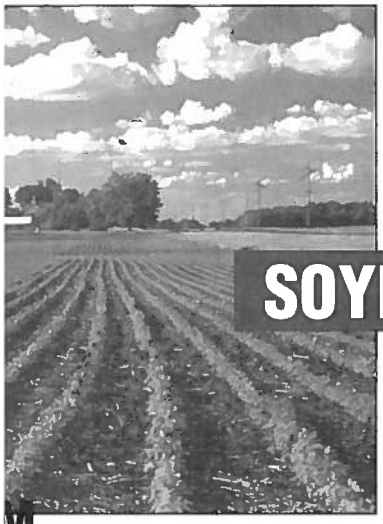
Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
4449RR	1,366	35.7	30	38	94	48	4.3	13
45A51*	1,555	39.7	32	40	99	51	3.5	11
46A52	1,355	37.6	30	40	99	51	2.5	11
4992.125	1,473	38.4	30	40	100	54	2.3	7
5152.098	1,539	39.0	32	40	102	53	2.0	8
5153.104	1,567	39.5	31	40	101	56	2.0	9
561RR	1,378	38.7	31	39	100	53	2.0	13
A 98-9NR	1,711	38.7	29	40	98	50	2.0	10
A4992.125	1,367	39.2	31	40	101	50	2.8	11
A5152.098	1,549	42.2	31	39	100	50	3.3	8
A5153.104	1,631	41.8	30	40	98	49	4.3	9
Arrow	1,383	37.6	33	40	100	54	4.0	9
CL2061	1,732	39.6	30	39	99	50	3.0	9
GoldnRdyRR	1,700	38.1	31	38	98	49	4.3	10
Hyola 357RR	1,652	38.4	29	36	94	43	4.3	10
IMC-203	1,434	36.3	32	41	97	53	3.5	10
LG 3235	1,497	37.0	31	37	95	44	4.3	9
LG 3275	1,494	38.5	31	37	95	45	3.0	11
LG 3295*	1,462	37.3	32	40	98	49	3.8	12
LG 3345	1,524	39.7	32	38	96	44	4.5	10
Minot	1,574	38.9	31	39	97	46	3.3	10
PR 3665	1,622	39.6	31	38	96	48	3.8	11
PR 5292	1,425	39.4	32	38	97	46	4.5	10
PR 5296	1,603	38.2	31	39	99	49	5.0	11
Quest*	1,506	37.5	31	38	98	46	4.3	11
SW B2674RR	1,561	38.5	30	39	97	50	2.5	8
SW B2675RR	1,475	38.1	31	39	100	49	3.0	9
SW B2677RR	1,377	38.5	31	39	100	55	3.0	8
SW RideR	1,717	38.4	30	39	98	52	2.3	11
SWRaideRR	1,707	37.6	30	39	97	55	2.5	11
Mean	1,531	38.6	31	39	98	50	3.3	10
LSD (0.05)	220	0.91	1.6	0.9	2.1	4.0	1.14	3.2
C.V.	10	1.7	3.6	1.6	1.5	5.7	24.4	23.0

Growth characteristics and oil content of Roundup Ready canola varieties grown near Kennedy, planted April 29, 1999.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat	Sclerotinia, % of Plants Infected
449RR	1,959	34.6	42	52	95	40	3.5	33
45A51*	2,139	36.4	44	54	100	45	2.3	26
46A52	1,863	35.3	43	54	98	43	2.3	33
561RR	1,770	36.0	43	54	98	44	1.8	25
A98-9NR	1,927	34.7	43	55	100	46	2.8	20
Arrow	1,721	34.1	43	53	95	43	3.5	40
Golden Ready RR	2,232	34.9	43	53	101	41	4.5	25
Hyola 357	2,114	35.8	40	50	99	37	2.0	20
LG3235	1,934	36.0	42	52	97	42	2.0	33
LG3275	1,846	34.8	41	51	96	40	2.0	36
LG3295*	1,959	35.0	41	54	97	42	2.8	29
Minot	2,065	36.1	42	52	97	41	3.0	35
PR3665	1,912	36.4	43	52	98	43	2.8	33
PR5292	1,879	36.0	42	52	97	42	2.8	38
PR5296	2,214	34.7	43	53	101	43	3.5	23
Quest*	1,782	35.7	44	53	100	41	3.0	22
SWB2674RR	2,123	36.3	39	53	98	47	1.8	29
SWB2675RR	1,794	35.2	44	53	97	41	2.3	25
SWB2677RR	2,121	35.6	41	53	98	44	2.0	26
SWRaideRR	2,125	36.5	41	55	100	52	1.3	36
Mean	1,980	35.5	42	53	98	43	2.6	29
LSD (0.05)	283	0.82	1.9	0.7	2.4	3.5	0.72	11.4
C.V.	10	1.6	3.1	0.9	1.8	5.7	19.9	27.7

Growth characteristics and oil content of Roundup Ready canola varieties grown Near Fosston, planted May 29, 1999.

Variety	Yield, Lb/Acre at 8% Moisture	Oil, % of Seed Wt at 8% Moisture	Days After Planting To: 95% Canopy Closure	Days After Planting To: Plot at 10% Bloom	Days After Planting To: Maturity: 30% Seed Color Change On Main Raceme	Height, Inches	Lodging, 1 = Erect 9 = Flat
45A51*	1,423	36.8	31	41	88	44	3.5
Arrow	917	35.0	34	41	88	48	2.8
Golden Ready	1,438	35.8	32	40	88	48	3.5
Hyola 357RR	1,613	37.2	27	38	85	44	2.8
LG 3235	1,539	36.5	28	38	83	46	2.5
LG 3275	1,323	36.1	29	39	84	44	2.3
LG 3295*	1,436	36.0	33	41	86	47	2.8
LG 3345	1,366	38.2	30	39	88	47	3.3
Minot RR	1,541	37.2	31	40	86	46	2.8
PR 3665	1,361	37.9	30	39	87	47	2.5
PR 5292	1,522	37.5	28	40	87	47	4.5
PR 5296	1,268	35.6	30	41	90	55	3.8
Quest*	1,358	36.5	29	39	87	49	3.0
SW Rider	1,293	35.8	28	41	88	50	3.0
Mean	1,386	36.6	30	40	87	47	3.1
LSD (0.05)	232	1.29	4.5	1.0	3.2	6.5	1.30
C.V.	12	2.5	10.5	1.8	2.6	9.7	29.8



SOYBEAN

Minnesota Agricultural Experiment ·tation scientists annually conduct per-ormance tests of adapted public and pri-ate soybean varieties. Companies are harged a fee for each variety they enter nd these fees are used to partially cover he costs of testing. A stipulation of the esting program is that the company is ıarketing the variety or intends to begin ıarketing it in the next growing season.

Tables on pages 72-76 present data from he regular public and private variety ests conducted annually at various loca-ions within the northern, central and outhern production zones. The map on age 71 shows zone boundaries. All of ıese tests were planted between May 1 nd May 25 at planting rates of 160,000 lants/acre. Preplant and postemer-ence herbicides were used as necessary or good weed control. Row spacings ere 30 inches at Becker and Fairmont nd 10 inches at all other locations. Plot ombines were used to harvest the yield om all plots.

Tables on pages 77-82 show results from pecific tests of available Roundup Ready® varieties adapted to the north-rn, central and southern production ones. Planting was accomplished as de-cribed above, except that the only her-icide used was two applications of the ıbeled rates of Roundup®.

The table on pages 83-84 provides re-ılts from the special performance tests f soybean cyst nematode resistant vari-ties in "infested" field sites near Lam-erton, Waseca and St. James and "non-infested" field sites near Fairmont, Lamberton, and Waseca. Planting techniques were the same as the regular performance tests.

The tables on pages 84-87 provide results from the special variety tests conducted in white mold infested field sites. Tables on page 77 provide results of the very early (northern Minnesota) and special southeastern Minnesota Public Variety tests. These locations were added to the program to provide data for environments not represented by the other location tests.

The table on pages 87-88 provides results from the special-use soybean variety tests conducted at several locations. These tests were added to provide reliable data for growers interested in producing these types of soybeans, which are typically grown under contract.

To better understand and use the data provided in these tables, please read the following additional information very carefully.

Relative Maturity and Calendar Dates of Maturity:

Soybeans respond to changing day length, so the actual calendar date of maturity is affected by latitude. Each soybean variety has a narrow range of north-south adaptation. Soybean yield and quality are assured if a variety arrives at physiological maturity before a season-ending freeze occurs. This date is determined visually by noting the actual date when 95 percent of the pods show their genetically programmed mature color. These dates for 1999 are provided in the tables. Maturity dates in 1999 after September 25 in the southern zone and after October 1 in the central and northern zones are estimates because frost occurred. Harvest dates are typically 7 to 14 days later, depending upon drying conditions.

Relative maturity ratings are also provided for each variety in the tables. These ratings consist of a number for the maturity group designation (000, 00, 0, 1, 2) followed by a decimal and another number, ranging from 0 to 9, which indicates a ranking within each maturity group. For example the variety Agassiz indicated as 0.0, making it the earliest group 0 variety, while Hendricks, with a 0.9 rating, is the latest. These values for public varieties are developed after observing them for several years in many locations. Relative maturity ratings for private varieties in these tables were provided by their owners, and were developed in a similar manner.

Yield

Because maturity is a very important attribute, varieties are arranged in the tables in order of their actual 1999 calendar date of maturity and not yield performance.

Later maturing varieties can usually be expected to have higher yields than earlier maturing types. If you wish to correctly compare yields, do so only between varieties with similar calendar dates of maturity, usually within 3 to 5 days. More reliable comparisons can be made using variety yields from several consecutive years. All yield determinations were made from replicated tests harvested with a plot combine.

LSD values associated with the data in these tables are measures of variability within the trials. If a yield difference between two varieties within a single column exceeds this LSD value you can assume that the higher yielding variety was truly better yielding. A 20-percent level of significance is used in all these tables. This means that yield differences exceeding the stated LSD value are real 80 percent of the time.

Chlorosis

Chlorosis ratings are based on how much of the leaf area was yellowing in tests conducted on high-lime (high pH) soils in southwest Minnesota in 1999. Comparing chlorosis scores of varieties permits you to estimate how well they perform relative to each other at this site. Actual chlorosis ratings can vary depending on the specific site and year of test.

Some universities and companies use numerical scores rather than word descriptors to describe chlorosis tolerance. A comparison of these systems follows:

Numerical Score		
1-5 scale	1-9 scale	Rating
1 to 2	1 to 2.5	Tolerant (T)
2.1 to 3	2.6 to 5	Moderately Tolerant (MT)
3.1 to 4	5.1 to 7.5	Moderately Susceptible (MS)
4.1 to 5	7.5 to 9	Susceptible (S)

Protein and Oil

Protein and oil values were determined on mature seed using near infrared reflectance analysis equipment. The table values are for the 1999 season only, absolute values of protein and oil can vary from year to year. Protein and oil values are expressed on a 13% moisture basis. This formula converts the protein and oil values to another moisture basis:

$$\frac{\text{100-desired moisture}}{87} \times \text{protein or oil value given in the table}$$

The value of a bushel of soybeans (APV) based on its oil and protein content can be calculated by:

$$APV = 60\,[Po\,(X) + \frac{Pm}{44}\,(Y)]$$

Where:

APV = Approximate value of a bushel of soybeans

Po = soybean oil price (in $ per pound)

Pm = price of 44% meal (in $ per pound)*

X = oil content at 13% moisture (in decimals)

Y = protein content at 13% moisture (in decimals)

And:

$$\frac{\text{* price of meal \$/ton}}{2{,}000} = \text{\$/pound}$$

Phytophthora

Phytophthora root rot can cause significant yield reductions if susceptible varieties are planted in poorly drained, infested fields. There are several known races of this fungus, so it is important to know which are present in your field. Genes can be incorporated into varieties to provide resistance to specific races of this disease.

Some published information refers to Phytophthora "tolerance" or "field resistance," which is not race-specific and should not be confused with race-specific resistance. Reliable tests for tolerance have not yet been developed.

The data tables in this report indicate the Phytophthora gene or genes present in each variety. The resistance chart below, left, will tell you which genes provide resistance to the various races.

Soybean Cyst Nematode:

Soybean Cyst Nematode (SCN) was first identified in Minnesota in 1978 and is now known to occur in many Minnesota counties where the soybean is grown. Both the area of infestation and numbers of nematodes per unit of soil appear to be increasing. Several races of this pest are known to occur in Minnesota. When SCN numbers are high, significant yield losses can occur. Rotations to non-host crops and planting of resistant varieties can assist in reducing nematode populations as well as reducing its impact on yield.

Yield performance results of susceptible, moderately resistant, and resistant varieties planted in infested and non-infested fields in southern Minnesota are provided on pages 83 and 84.

Additional information on procedures for testing your fields for SCN can be obtained from your county extension office or the Soybean Nematology Lab at the Southern Experiment Station, Waseca, MN 56093.

Management information is available from your county extension office or from the Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, North Mankato, MN 56003, 1-888-896-9678, www.mnsoybean.org

White Mold

This disease is also known as Sclerotinia stem rot. Accurate ratings for resistance to this disease are difficult to obtain because the infection process is very dependent on environmental conditions during flowering. Because of this variability, a variety can appear to be resistant one year or in one location and be devastated if conditions are more conducive to spread of the disease. Growers should plant varieties that consistently show less disease over several years of testing.

In 1999 some varieties were evaluated under field conditions in locations in the three soybean production regions of Minnesota. These tests were conducted by J.E. Kurle, Department of Plant Pathology, University of Minnesota. Data collected consisted of ratings of percentages of infected plants present in the various plots during the growing season. Data are presented on pages 84-87.

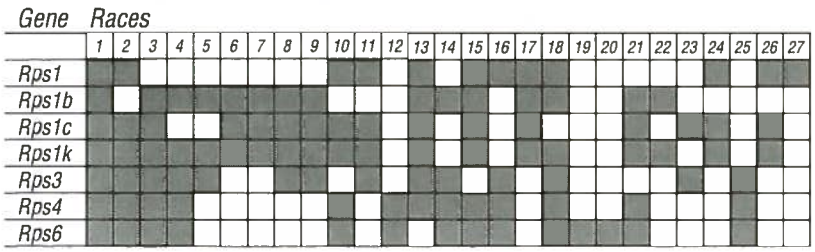
Additional white mold management information is available from Minnesota Soybean Research and Promotion Council, 360 Pierce Avenue, Suite 110, North Mankato, MN 56003, 1-888-896-9678, www.mnsoybean.org

Brown Stem Rot

Brown stem rot (BSR) is a fungal disease that can cause yield losses in certain situations. The disease occurs most frequently when soybeans follow soybeans but can occur where soybeans are planted every other year. Resistant varieties, or longer rotations, assist in the management of this disease. IA 1006, Freeborn, Granite, Faribault, Archer, and IA2008R are available public varieties with resistance to BSR. 2063RR, LO292, 1174WM, and L1309CN are the privately developed varieties reported to be resistant to BSR.

Some information refers to "tolerance" or "field resistance." Reliable tests for

Genes for resistance to various races of Phytophthora root rot



Soybean Maturity Zones

olerance or field resistance have not yet een developed.

pecial-Use Varieties

ecently there has been increased interest ı producing soybeans with special charac-ristics important to specialty food prod-ct manufacturers. Soybean scientists reviously developed some of these spe-al-use varieties, which were general re-ases, but more recently have been releas-ıg some of them under exclusive con-acts to specific companies who will then ontract with growers for their produc-on. The table on pages 87-88 presents ıe most recent data available on the per-ormance and characteristics of several of ıese special-use varieties. Contact the wner/developer or exclusive marketing ompany, if you are interested in further ıformation about these varieties.

ublicly Developed Varieties

ıformation about the publicly devel-ped varieties entered in 1999 tests is resented in tables on pages 88-89.

Soybean Planting Rate and Date

Bushel Weight, Pounds	60
Seeds/Pound	2,800
Planting Rate, Pounds/Acre	56
Planting Rate, Seeds Ft. of Row	
7-inch rows	2
10-inch rows	3
20-inch rows	6
22-inch rows	7
30-inch rows	9
Planting Date	May 1 to May 10

Privately Developed Varieties

Contact addresses and brand names for privately developed varieties entered in these 1999 tests are:

Agri-Tel Grain, Robert Small, Box 808, Beause Jour, MB, Roe OCO
AgriPro Seeds (AP), 824 2nd Street South, P.O. Box 250, Brookings, SD 57006-0250
Albert Lea Seed House (Viking), P.O. Box, 127, 1414 W. Main, Albert Lea, MN 56007
Anderson Seeds (Anderson), RR 3 Box 94, St. Peter, MN 56082
Asgrow (Asgrow), P.O. Box 7570, Des Moines, IA

Cenex/Land O'Lakes, 2827 8th Ave. South, Fort Dodge, IA 50501
CroPlan Genetics (CroPlan), Dr. Jack Carlson, 5600 Cenex Dr., Inver Grove Hts, MN 55077
Dahlco Seeds (Dahlco),14730 15th St. S.W., Cokato, MN 55321
Dahlman Seeds (Dahlman), 73504 200th St., Dassel, MN 55325
Dairyland Seed Co., Inc. (Dairyland), 3570 Highway H, P.O. Box 958 West Bend, WI 53095

Dekalb Genetics Corp., 3100 Sycamore Rd., DeKalb, IL 60115
Dennis Ewing Farm Seed (Yield King), 6131 North Fork Road, Ames, IA 50010
Domestic Seed & Supply, Inc. (Mustang), 306 South Washington, Madison, SD 57042
Cargill Hybrid Seed, (Cargill), P.O.Box 5645, Minneapolis, MN 55440
Garst Seed Co. (Garst), 2369 330th Street, Box 500, Slater, IA 50244

Gold Country Seed, Inc. (GCS), 16506 Hwy. 15 N, P.O. Box 604, Hutchinson, MN 55350
Golden Harvest Seeds (Golden Harvest), 100 J.C. Robinson Blvd., P.O. Box A, Waterloo, NE 68069
Great Lakes Hybrids, Inc. (Great Lakes), 9915 W. M-21, Ovid, MI 48866
Hyland Seeds, Div. of W.G. Thompson & Sons, Ltd., P.O. Box 130, 145 Marlborough Street, Blenheim, Ontario, NOP 1A0, Canada

Interstate Payco Seed Company (Payco), Box 338, West Fargo, ND 58078
Jung Seed Genetics (Jung), 341 S. High St.,Randolph,WI 53956
Kaltenberg Seeds (Kaltenberg), P.O. Box 278, Waunakee, WI 53597
Kruger Seed Company (Kruger), Highway 20 East, Box A, Dike, IA 50624
KSC/Challenger, Box A, Dike, IA 50624

Latham Brothers Farm (Latham), 131 180th St., Alexander, IA 50420
Latham Seed Company (Latham), 131 180th St., Alexander, IA 50420
LG Seeds (LG), 905 Dexter St., P.O. Box 216, Prescott, WI 54021
Mallard Seed Co., (Mallard) P.O. Box 637, Plainview, Mn 55964
Midwest Seed Genetics (MW Genetics), P.O. Box 518, Carroll, IA 51401

Monsanto Global Seed Group, (Dekalb), 3100 Sycamore Road, Dekalb, IL 60115
Mycogen Seeds, 1340 Corporate Center, St. Paul, MN 55121
NorthStar Genetics (NS), Box 40, Wanamingo, MN 55983
Novartis Seeds (NK), 7500 Olson Memorial Hwy, Golden Valley, MN
Peterson Farms Seed Inc. (Peterson Farms), 3104 164th Avenue SE, Harwood, ND 58042

Pioneer Hi-Bred Int'l, Inc. (Pioneer), 130 SE Willmar Ave., Willmar, MN 56201
Prairie Brand Research (PBR), 15 X Ave., Story City, IA 50248
Prairie Brand Seed Company (Prairie Brand), 15 X Ave., Story City, IA 50248
Profiseed, Inc. (Profiseed), 1691 Highway 65, Hampton, IA 50441
Prograin, (Peterson), 145 Bas Riviere Nord, St-Cesaire Quebec Jolito

Proseed Inc. (Proseed), 705 E Brewster, Harvey ND 58341
Ramy International, Ltd. (Ramy), 1329 N. Riverfront Drive, P.O. Box 3722, Mankato, MN
Renk Seed Co., (Renk) 6800 Wilburn Rd., Sun Prairie, WI 53590
Renze Hybrids, Inc. (Renze), 27410 Kittyhawk Avenue, Carroll, Iowa 51401
Sand Seed Service, Inc. (Sands), 4765 Highway 143, Marcus, IA 51035

Sansgaard Seed Farms, Inc. (Sansgaard), 15 X Avenue, Story City, IA 50248
Stine Seed Co., 2225 Laredo Trail, Adel, IA 50003
Stine Seed Farm, 2225 Laredo Trail (Stine), Adel, IA 50003
Terra Industries, Inc. (Terra), P.O. Box 6000, Sioux City, IA 51102-6000
Thunder Seed Inc, RR2 Box 239, Hawley MN 56549

Thompson Agronomics, Inc., 40321 130th Avenue (Thompson), Leland, IA 50453
Thompson Seeds, Inc., 40321 130th Ave. (Thompson), Leland, IA 50453
Top Farm Hybrids (Top Farm), 17177 60th Street SW, Cokato, MN 55321
Trelay Seeds (High Cycle), 11623 State Road 80, Livingston, WI 53544
UAP Seeds/Dyna Gro (UAP), Box 55, Kasota, MN 56050

United Suppliers Inc, (U.S. Seeds) 30473 260th St., P.O. Box 538, Eldora, IA 50627
Wensman Seed Company (Wensman), P.O. Box 190, 102 Aldrich Avenue, Wadena, MN 56482
Wilfarm LLC, (Wilfarm), 5401 N. Oak Traffilway, Gladstone MO 64118
Ziller Seed Co., Inc. (Ziller), R.R. 1, Box 122, Bird Island, MN 55310

Performance and characteristics of public and private soybean varieties, northern zone; Crookston, Moorhead and Shelly, 1997-1999.

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 1997-99	1998-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
OAC Vision	Peterson	9-13	–	27	30	37	16	00.0	S	5
Corona	Hyland	9-14	–	–	42	34	17	00.2	S	2
Daksoy	N.D. AES	9-16	36	35	37	34	17	00.7	S	4
R0725	Ramy	9-18	–	–	50	32	18	00.7	S	3
Jim	N.D. AES	9-18	40	43	46	34	17	00.8	S	3
McCall	Minn. AES	9-18	34	33	35	34	17	00.7	S	3
L0083	Croplan	9-19	–	35	46	34	17	0.0	S	3
013	Mycogen	9-19	36	34	44	33	17	0.1	S	2
9007	Pioneer	9-19	35	36	44	34	17	0.07	Rps1	3
Glacier	Minn. AES	9-24	38	39	53	37	16	00.8	Rps6	3
Agassiz	Minn. AES	9-24	33	32	44	35	17	0.0	Rps1	3
5007	Mycogen	9-26	–	–	49	34	17	00.7	S	3
Traill	N.D. AES	9-27	40	43	55	36	16	0.0	S	3
MN0301	Minn. AES	9-27	40	38	48	32	18	0.3	Rps1	3
CX007	Dekalb	9-27	–	–	46	34	17	0.0	S	4
R0925	Ramy	9-27	–	–	45	34	17	00.9	S	3
DS9030	Dahlco	9-28	38	38	55	35	16	0.3	Rps1	3
90B43	Pioneer	9-29	–	42	55	33	17	0.4	Rps1c	2
R300	Ramy	9-29	–	–	53	35	16	0.3	S	3
9038	Proseed	9-30	–	–	54	35	17	0.3	S	3
0523	Northstar	9-30	–	35	48	35	16	0.3	S	3
S00-66	NK Brand	9-30	–	–	37	34	17	0.6	S	4
L0292	Croplan	10-1	–	–	57	33	17	0.2	Rps1k	4
Council	N.D. AES	10-1	39	39	54	34	17	0.5	Rps1	3
0398	Thunder	10-2	–	–	50	35	17	0.3	S	3
S05-D5	Novartis	10-2	–	–	48	33	17	0.4	Rps1k	3
5072	Mycogen	10-2	–	–	47	34	17	0.7	Rps1	4
Korada	Peterson	10-2	37	35	43	34	17	0.1	Rps1c	3
90B21	Pioneer	10-2	–	35	40	33	17	0.2	Rps1k	4
Ozzie	Minn. AES	10-2	32	29	38	36	16	0.3	Rps1	4
Lambert	Minn. AES	10-3	40	40	51	35	17	0.8	Rps1	3
TS036	Terra	10-3	–	36	46	35	16	0.3	S	4
Evans	Minn. AES	10-3	38	38	45	34	17	0.6	Rps1	4
TF 6038	Topfarm	10-3	–	32	45	34	17	0.3	S	3
W3036	Wensman	10-3	33	30	40	34	17	0.3	Rps1c	4
PR9712	Peterson	10-4	–	–	47	35	16	0.1	S	4
M-0700	Mustang	10-4	–	38	46	34	17	0.7	S	4
M-0970	Mustang	10-4	–	38	44	34	17	0.9	S	3
0480	Stine	10-4	38	37	41	34	17	0.3	S	3
D085	Garst	10-5	–	39	49	35	16	0.8	Rps1k	2
MN0901	Minn. AES	10-5	–	–	46	33	18	0.9	Rps1	4
0001	Northstar	10-5	–	–	40	35	16	0.0	S	4
DSR-065	Dairyland	10-6	38	36	46	32	17	0.7	Rps1c	2
9809	Payco	10-6	–	39	46	35	16	0.9	S	4
E-069	Mustang	10-6	–	–	40	34	17	0.0	S	3
PB-117	Prairie Brand	10-6	–	–	36	35	16	0.9	S	2
0790-0	Stine	10-7	–	–	44	35	16	0.7	S	4
PB-087	Prairie Brand	10-7	–	–	33	34	17	0.9	S	3
PB-098	Prairie Brand	10-8	37	35	39	35	16	0.9	S	2
M-0958	Mustang	10-8	–	34	37	35	17	0.9	S	3
1090-6	Stine	10-9	–	39	43	34	17	1.0	S	3
PB-097	Prairie Brand	10-9	38	35	37	34	17	0.9	Rps1c	4
LSD 20%			1	1	3					

Performance and characteristics of public and private soybean varieties, central zone; Becker, Morris and Rosemount, 1997-1999.

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre			Percent		Maturity Rating	Phytophthora Gene	Chlorosis Score
			1997-99	1998-99	1999	Protein	Oil			
MN0301	Minn. AES	9-11	51	52	50	35	18	0.3	Rps1	3
0B43	Pioneer	9-12	–	–	63	34	18	0.4	Rps1c	2
Corada	Peterson	9-12	–	–	52	35	18	0.1	Rps1c	3
6038	Topfarm	9-13	–	–	64	34	18	0.3	S	4
Ozzie	Minn. AES	9-13	47	49	46	36	16	0.3	Rps1	3
6072	Mycogen	9-14	–	61	59	35	17	0.7	Rps1	4
8069	Proseed	9-14	–	–	59	34	18	0.6	S	5
DS-9071	Dahlco	9-15	–	–	58	35	17	0.7	Rps1k	3
0085	Garst	9-15	–	58	57	35	17	0.8	Rps1k	2
Council	N.D. AES	9-15	52	55	57	35	17	0.5	Rps1	3
9071	Pioneer	9-16	59	62	61	34	17	0.7	Rps1c	2
EXP21175	Ziller	9-16	–	64	61	35	17	1.3	S	3
608-80	Novartis	9-16	–	–	60	36	16	0.8	Rps1c	4
C-905	Dahlco	9-16	–	–	59	35	16	0.5	S	2
Enterprise	Hyland	9-16	–	–	58	35	16	0.7	S	3
Evans	Minn. AES	9-16	53	56	55	35	18	0.6	Rps1	4
6093	Mycogen	9-17	–	–	63	35	17	0.9	S	4
91B01	Pioneer	9-17	60	62	62	35	17	1.0	Rps1k	3
8600	Ramy	9-17	–	–	61	36	16	0.6	S	3
6077	Topfarm	9-17	–	–	61	34	18	0.7	Rps1c	2
MN0901	Minn. AES	9-17	–	61	61	34	17	0.9	Rps1	4
RS099S	Renk	9-17	–	–	60	35	17	0.9	S	3
Lambert	Minn. AES	9-17	55	59	59	35	17	0.8	Rps1	3
9119	Proseed	9-18	–	–	65	35	18	1.1	Rps1c	3
A0868	Asgrow	9-18	–	65	64	34	18	0.8	Rps1k	3
SOI-118	Sands	9-18	–	–	61	36	17	1.1	S	4
Hendricks	Minn. AES	9-18	57	60	60	35	17	0.9	Rps1	3
995	Trelay	9-18	–	60	58	34	18	0.9	S	4
CB090	Kaltenberg	9-19	–	–	68	36	16	0.9	S	3
91100	Ramy	9-19	–	–	68	33	17	1.1	Rps1c	2
V3107	Wensman	9-19	61	64	67	35	17	1.0	Rps1c	3
C-0999+	KSC/Challenger	9-19	–	68	66	35	17	0.8	Rps1c	4
EX8137	Thompson	9-19	–	–	65	35	17	1.5	S	2
910	Mallard	9-19	–	–	64	35	17	1.0	S	3
997	Thunder	9-19	–	–	64	35	17	0.9	S	2
MN1401	Minn. AES	9-19	–	58	58	36	16	1.4	Rps1	3
Cato	Minn. AES	9-19	54	57	55	37	17	1.3	Rps1	4
930	Mallard	9-20	–	–	67	35	17	1.2	Rps1c	4
EXP23195	Ziller	9-20	–	–	66	35	17	1.3	S	3
Sentry	Hyland	9-20	–	–	63	35	17	1.2	S	4
9933	Northstar	9-20	–	–	63	35	17	0.9	S	3
Surge	Minn. AES	9-20	59	64	63	37	16	1.3	Rps1	3
M-1160	Mustang	9-20	62	66	61	35	17	1.6	S	4
6089	Proseed	9-20	–	–	61	34	17	0.8	Rps1c	4
MN1301	Minn. AES	9-20	58	62	61	36	16	1.3	Rps1c	3
M-1128	Mustang	9-21	–	65	63	35	17	1.3	S	3
9121	Mycogen	9-22	–	66	65	35	17	1.2	Rps1k	2
9149	Proseed	9-22	–	–	64	35	17	1.4	Rps1c	2
C-1415	Kruger	9-22	–	–	63	35	17	1.2	S	3
CB120	Kaltenberg	9-22	–	–	61	35	17	1.2	Rps1k	2
29814	Novartis	9-23	–	–	67	35	17	1.4	Rps1c	5

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 1997-99	1998-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
DS-9140	Dahlco	9-23	–	–	63	37	16	1.4	Rps1k	4
K-1444+	Yield King	9-23	63	65	62	35	17	1.2	S	3
L1309CN	Croplan	9-23	–	–	61	34	17	1.3	S	3
PBR-138	PBR	9-24	–	–	70	35	17	1.3	S	3
PB-141	Prairie Brand	9-24	–	–	68	36	17	1.4	S	3
R1500CN	Ramy	9-24	–	–	58	35	17	1.5	S	2
RS1498	Renk	9-25	–	–	73	35	17	1.4	S	3
140 Brand	Latham	9-25	–	70	70	35	17	1.4	S	4
1443	Northstar	9-25	–	70	70	36	17	1.4	S	2
X-915	Dahlco	9-25	–	–	69	35	17	1.5	S	2
W3148	Wensman	9-25	–	73	69	35	17	1.4	S	3
6148	LG Seeds	9-25	–	–	68	35	17	1.4	S	4
1142	Jung	9-25	–	–	67	35	17	1.4	S	2
K-1414	KSC/Challenger	9-25	–	68	67	36	16	1.2	S	3
G1410	Midwest Seed	9-25	–	–	67	35	17	1.4	S	4
Parker	Minn. AES	9-25	60	64	67	35	17	1.5	Rps1	3
EX7103	Thompson	9-25	–	–	66	34	18	1.5	S	4
SOI-144	Sands	9-26	–	71	73	36	17	1.4	Rps1	3
K-1333	Kruger	9-26	68	70	71	36	17	1.2	S	3
91B53	Pioneer	9-26	–	–	70	36	17	1.5	S	3
X1700	Stine	9-26	–	–	70	34	17	1.5	Rps1	4
DSR-158	Dairyland	9-26	63	67	67	36	16	1.5	S	2
KB148	Kaltenberg	9-26	–	–	65	36	17	1.4	S	2
Freeborn	Minn. AES	9-26	–	61	60	36	16	1.6	Rps1	3
CX072	Dekalb	9-26	–	–	59	36	16	0.7	Rps1k	2
1386-6	Stine	9-27	67	72	70	36	17	1.3	S	3
PB-146	Prairie Brand	9-27	68	71	69	35	17	1.4	S	3
K-1666	Kruger	9-28	–	–	68	35	16	1.4	S	2
DSR-180/STS	Dairyland	9-28	64	68	66	35	17	1.9	S	4
IA1006	Iowa AES	9-28	–	–	62	35	17	1.9	S	3
Granite	Minn. AES	9-28	–	60	59	35	16	1.8	Rps1	3
K-1666+	Yield King	9-29	–	–	73	36	16	1.4	S	2
PB-163	Prairie Brand	9-29	–	–	72	36	16	1.5	Rps1	4
2500	Stine	9-29	67	70	70	35	17	1.5	S	3
K-2125	KSC/Challenger	9-30	–	71	70	34	17	1.7	S	3
M-1138	Mustang	9-30	–	70	68	35	17	1.3	S	3
250 Brand	Latham	9-30	–	67	65	35	17	1.7	S	3
K-1777	KSC/Challenger	10-1	69	73	73	35	17	1.5	S	4
PB-162-2	Prairie Brand	10-1	–	–	69	35	17	1.5	S	4
K-1943+	Yield King	10-1	–	72	69	35	16	1.7	S	3
KB208	Kaltenberg	10-1	–	–	68	36	16	2.0	S	3
K-2040	Kruger	10-2	–	–	65	36	16	1.7	S	2
K-2131+	Yield King	10-2	–	–	64	35	16	1.7	S	2
LSD 20%			1	1	2					

'erformance and characteristics of public and private soybean varieties, southern zone; Veseca, Lamberton and Fairmont, 1997-1999.

ariety	Brand or Originator	Mature Date	Yield, Bushels/Acre 1997-99	1998-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
IN1301	Minn. AES	9-17	49	51	48	35	17	1.3	Rps1c	3
ato	Minn. AES	9-17	48	48	42	37	16	1.3	Rps1	3
1N1401	Minn. AES	9-19	–	51	45	34	17	1.4	Rps1	3
1500CN	Ramy	9-20	–	–	47	33	18	1.5	S	2
163	Pioneer	9-22	52	52	48	33	18	1.6	Rps1c	3
1B53	Pioneer	9-24	–	58	58	35	18	1.5	S	3
/3148	Wensman	9-24	–	60	56	35	18	1.4	S	3
S158	Terra	9-24	–	59	54	35	17	1.5	S	4
1N1801	Minn. AES	9-24	–	55	51	35	17	1.8	Rps1	4
P1755	Agripro	9-24	–	54	50	34	18	1.7	Rps1c	4
630	Viking	9-24	–	–	50	34	18	1.6	Rps1c	4
'arker	Minn. AES	9-24	50	51	48	33	18	1.5	Rps1	3
IS S159	US Seeds	9-25	–	–	54	35	18	1.5	S	2
:1725	Ramy	9-25	–	–	49	34	17	1.7	S	3
A1006	Iowa AES	9-25	54	54	49	34	17	1.6	S	3
reeborn	Minn. AES	9-25	51	52	49	35	17	1.6	Rps1	3
lert	Minn. AES	9-25	50	51	47	33	18	1.8	Rps1	3
:turdy	Minn. AES	9-25	53	53	46	34	17	2.0	Rps1	3
:X166	Dekalb	9-26	–	–	55	34	17	1.6	S	3
2104	Asgrow	9-26	–	–	54	34	17	2.1	S	4
F6188	Topfarm	9-26	–	57	54	33	18	1.9	Rps1c	3
3T 6190	Ziller	9-26	–	59	54	34	17	1.9	S	3
-3182	Thompson	9-26	–	–	51	32	18	1.8	S	4
Granite	Minn. AES	9-26	51	51	46	35	17	1.8	Rps1	3
EXP23498	Ziller	9-27	–	–	55	32	18	1.8	S	4
KB214	Kaltenberg	9-27	–	–	53	34	17	2.1	S	4
S194	Terra	9-27	59	60	53	34	18	1.9	S	4
521-A1	NK Brand	9-27	–	–	52	34	18	2.1	Rps1k	4
1198	Jung	9-27	–	–	52	32	18	1.9	Rps1	2
207	Trelay	9-27	–	58	52	35	17	2.0	S	4
Hardin 91	Iowa AES	9-27	54	55	52	34	17	2.0	Rps1k	4
RS2098	Renk	9-27	–	–	52	34	17	2.0	S	3
T-3193	Thompson	9-27	–	59	51	32	18	1.9	S	3
DS 9210	Dahlco	9-27	–	–	51	34	17	2.0	Rps1c	2
1060	Mallard	9-27	–	–	50	31	18	1.9	Rps1c	2
200	Mycogen	9-27	57	56	50	33	18	2.1	S	5
TF6197	Topfarm	9-27	–	54	49	34	17	1.8	S	4
PBR-218	PBR	9-28	58	59	56	32	18	2.2	S	4
2199	Viking	9-28	–	–	55	35	17	2.1	S	3
DS 9190	Dahlco	9-28	–	–	54	33	17	1.9	S	3
5200	LG Seeds	9-28	–	–	53	33	18	2.0	Rps1c	4
GL1872	Great Lakes	9-28	58	59	52	34	17	1.8	S	3
PB-194	Prairie Brand	9-28	58	57	52	34	17	1.9	S	3
X181	Kaltenberg	9-28	–	–	51	34	17	1.8	S	3
IA2021	Iowa AES	9-28	56	56	51	32	18	2.2	Rps1k	3
X98-19	NK Brand	9-28	–	–	51	33	18	2.0	Rps1	4
92B23	Pioneer	9-28	–	57	51	33	17	2.2	Rps1k	4
2030	Viking	9-28	–	–	49	34	18	2.0	S	4
IA1008	Iowa AES	9-28	–	–	47	33	17	2.1	S	4
W3207	Wensman	9-29	–	64	57	34	17	2.0	S	3
X97-21	NK Brand	9-29	–	–	56	34	17	2.1	S	3

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 1997-99	1998-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
PS2209	Profiseed	9-29	–	–	56	33	18	2.2	S	4
T-3222	Thompson	9-29	61	62	55	34	17	2.2	S	3
PBR-202	PBR	9-29	61	62	55	34	17	2.0	S	4
K-2404	Kruger	9-29	–	–	55	34	17	2.1	S	4
9233	Pioneer	9-29	59	60	55	34	17	2.3	S	4
K-2125	KSC/Challenger	9-29	–	61	53	33	18	1.7	S	3
K-2404+	KSC/Challenger	9-29	–	–	53	33	18	2.1	S	4
S-229-1	Sansgaard	9-29	–	–	53	34	17	2.2	S	4
392 BRAND	Latham	9-29	61	62	53	34	17	1.9	S	3
S220-2	Sansgaard	9-29	–	–	53	34	17	2.3	S	3
2002	Northstar	9-29	61	61	53	35	17	2.0	S	3
SOI 245	Sands	9-29	–	–	52	33	18	2.4	S	5
M-2238	Mustang	9-29	–	59	52	33	17	2.3	S	4
1070	Mallard	9-29	–	–	51	34	17	1.9	S	4
DSR-218	Dairyland	9-29	–	57	51	34	17	2.2	S	3
K-2232	KSC/Challenger	9-29	–	–	50	34	17	2.0	S	2
1050	Mallard	9-29	–	–	50	34	17	1.9	S	5
X98-18	NK Brand	9-29	–	–	49	32	17	1.9	Rps1c	3
S-203	Sansgaard	9-29	–	–	49	35	17	2.0	Rps1	3
A2247	Asgrow	9-29	–	57	48	35	17	2.2	Rps1k	4
R2198	Ramy	9-30	–	–	56	34	17	2.1	S	5
PB-217	Prairie Brand	9-30	–	–	56	33	18	2.1	S	4
K-2343	KSC/Challenger	9-30	61	62	55	35	17	1.9	S	3
SOI 169	Sands	9-30	61	61	55	34	17	2.0	S	3
E-206	Mustang	9-30	–	–	55	33	18	2.0	S	3
K-2425	Yield King	9-30	62	62	55	33	17	2.2	S	4
PB-197	Prairie Brand	9-30	60	59	53	34	17	1.9	S	4
M-2218	Mustang	9-30	–	59	52	34	17	2.1	S	5
PBR-214-2	PBR	9-30	–	–	52	35	17	2.2	S	3
KB220	Kaltenberg	9-30	–	–	52	33	17	2.2	S	3
NK2525A	Yield King	9-30	–	61	52	34	17	2.3	S	4
K-2625+	Kruger	9-30	61	61	52	34	17	2.3	S	4
2180	Stine	9-30	61	61	52	34	17	2.2	S	4
2490-1	Stine	9-30	–	61	52	32	18	2.4	S	4
K-2555	Yield King	9-30	–	–	51	33	17	2.3	S	3
PBR-216	PBR	9-30	60	61	51	34	17	2.1	S	5
IA2008R	Iowa AES	9-30	56	57	50	34	17	2.2	Rps1k	3
L2495	Croplan	9-30	–	–	50	32	18	2.4	Rps1	5
EX-530	Latham	9-30	–	–	48	34	17	2.2	S	4
S-237	Sansgaard	9-30	–	59	47	33	18	2.4	S	4
K-2525+	Kruger	10-1	–	61	53	33	18	2.3	S	4
EXP221	Sands	10-1	–	–	52	33	18	2.2	S	4
640 BRAND	Latham	10-1	59	58	49	35	17	2.3	S	4
K-2545+	Yield King	10-1	–	–	48	35	17	2.3	Rps1k	4
PB-235	Prairie Brand	10-2	59	59	51	36	17	2.4	S	3
K-2535	Kruger	10-2	–	58	51	36	16	2.4	S	3
G2380	Midwest Seed	10-2	–	–	50	35	17	2.3	S	4
SOI 243	Sands	10-2	–	60	48	35	17	2.4	S	3
RS2498	Renk	10-3	–	–	53	35	17	2.4	S	3
5249	Mycogen	10-3	–	–	46	35	17	2.4	S	5
IA2038	Iowa AES	10-3	–	53	44	34	17	2.4	S	5
LSD 20%			1	1	2					

'erformance and characteristics of very early maturing public soybean varieties, 1995-1999.

ariety	Maturity Rating	Yield, Bushels/Acre			Average	Percent		Phytophthora Gene	Chlorosis Score
		Grand Rapids	Roseau	Kennedy		Protein	Oil		
aksoy	00.6	25	25	47	27	38	17	S	4
lcCall	00.7	21	23	39	24	37	17	S	3
m	00.7	25	26	45	27	38	18	S	4
lacier	00.8	21	23	40	23	38	17	Rps6	3
gassiz	0.0	24	25	43	26	38	17	Rps1	3
aill	0.0	20	24	42	24	38	17	S	3
SD 20%		1	1	3	2				

'erformance and characteristics of public soybean varieties, southeastern Minn., 1995-1999.

ariety	Maturity Rating	Yield, Bushels/Acre	Percent		Phytophthora Gene	Chlorosis Score
			Protein	Oil		
ambert	0.8	41	38	18	Rps1	3
ato	1.3	42	40	16	Rps1	3
arker	1.5	45	36	18	Rps1	4
reeborn	1.6	43	37	17	Rps1	4
ert	1.8	43	36	17	Rps1	4
ranite	1.8	43	37	17	Rps1	4
ardin 91	1.9	45	38	17	Rps1k	4
turdy	2.0	46	38	16	Rps1	3
\2021	2.1	46	36	18	Rps1k	4
\2008R	2.2	42	36	18	Rps1k	3
SD 20%		1				

'erformance and characteristics of Roundup Ready soybean varieties, northern zone, Moorhead and Shelly, 1999.

ariety	Brand or Originator	Mature Date	Yield, Bushels/Acre	Percent		Maturity Rating	Phytophthora Gene	Chlorosis Score
				Protein	Oil			
0B31	Pioneer	9-18	39	34	17	0.3	S	3
99007	NK Brand	9-28	47	36	16	0.7	S	4
03RR	Thunder	9-30	50	33	17	0.3	S	4
BR-0303RR	PBR	9-30	49	34	17	0.3	S	5
/2039RR	Wensman	9-30	49	33	17	0.3	S	5
9904	NK Brand	9-30	43	32	17	0.3	Rps1c	4
R Rugged	Hyland	10-1	49	34	18	0.3	S	4
S 9051RR	Dahlco	10-1	46	33	17	–	S	5
03RR	Dahlman	10-1	46	34	17	0.3	S	5
414RR	Northstar	10-1	46	35	17	0.3	S	4
-0707RR	Sansgaard	10-2	51	33	18	0.7	Rps1c	4
/2058RR	Wensman	10-2	47	34	17	0.5	S	5
BR-0717RR	PBR	10-2	44	33	18	0.7	S	3
S 9090RR	Dahlco	10-2	42	35	17	–	S	5
B-1030RR	Prairie Brand	10-2	39	35	17	0.9	Rps1c	4
-0505RR	Sansgaard	10-3	49	33	17	0.5	S	5
059RR	Top Farm	10-3	49	33	18	0.3	S	4
503RR	Northstar	10-3	45	34	17	0.3	S	5
90537RR	Golden Harvest	10-3	44	35	17	0.5	S	4
SR091/RR	Dairyland	10-3	43	33	18	0.9	S	4
/2079RR	Wensman	10-4	47	35	17	0.7	S	4
909RR	Interstate	10-4	45	35	17	0.9	S	5
-091RR	Mustang	10-4	45	35	17	0.9	S	5
B-0730RR	Prairie Brand	10-4	42	34	17	0.6	Rps1k	4

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre	Percent Protein	Percent Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
PB-0910RR	Prairie Brand	10-5	46	35	17	0.6	Rps1k	5
PBR-1093RR	PBR	10-5	43	36	17	0.9	Rps1k	2
M-079RR	Mustang	10-5	40	34	17	0.7	Rps1k	4
EX9112RR	Interstate	10-5	37	36	17	1.1	Rps1k	3
S-0740RR	Sansgaard	10-5	35	35	16	0.7	S	4
PBR-0920RR	PBR	10-6	42	35	17	0.8	S	3
PB-0909RR	Prairie Brand	10-6	40	33	18	0.8	Rps1k	3
0990-4	Stine	10-6	38	35	17	0.9	S	5
LSD 20%			3					

Performance and characteristics of Roundup Ready soybean varieties, central zone, Rosemount and Morris 1998, 1999.

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	Yield, Bushels/Acre 1999	Percent Protein	Percent Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
6070RR	Topfarm	9-18	–	40	33	18	0.7	S	4
207RR	Thunder	9-19	–	51	34	19	0.7	Rps1c	5
90B93	Pioneer	9-20	55	52	36	17	0.9	Rps1c	4
AG0801	Asgrow	9-20	–	51	34	17	0.8	S	3
808RR	Dahlman	9-20	–	51	33	18	0.8	S	5
91B02	Pioneer	9-20	54	50	35	17	1.0	Rps1c	4
RR Rattler	Hyland	9-20	–	46	35	17	0.8	S	3
RR0059	Proseed	9-20	–	46	35	17	0.5	S	4
6059RR	Topfarm	9-20	–	40	34	18	0.3	S	4
AG0901	Asgrow	9-21	56	58	35	17	0.9	S	3
90B72	Pioneer	9-21	51	49	34	17	0.7	Rps1	2
R580RR	Ramy	9-21	–	41	34	18	0.5	S	4
AG1301	Asgrow	9-22	–	59	34	18	1.3	S	4
W 2098RR	Wensman	9-22	57	56	35	17	0.9	S	4
8097	Jung	9-22	–	55	35	17	0.9	S	4
1096-4	Stine	9-22	–	55	36	17	1.1	S	5
H-0979RR	Golden Harvest	9-22	–	50	35	17	0.9	S	4
KB119RR	Kaltenberg	9-22	49	48	36	16	1.1	Rps1k	3
2101RR	High Cycle	9-23	–	56	35	17	1.0	S	5
9909RR	Payco	9-23	–	55	36	17	0.9	S	5
R1080RR	Ramy	9-23	–	55	36	16	1.0	S	3
K-099+RR	Kruger	9-23	–	54	35	17	0.7	S	5
M-091RR	Mustang	9-23	–	54	35	17	0.9	S	4
R980RR	Ramy	9-23	–	54	36	17	0.9	S	5
RS099RR	Renk	9-23	–	53	34	17	0.9	Rps1k	3
3115RR	Dyna-Gro	9-23	–	53	35	17	1.1	S	4
1103RR	Northstar	9-23	–	53	36	17	1.1	S	4
AP1080	Agripro	9-23	–	49	35	17	1.0	S	4
9909RR	Garst	9-23	–	49	36	17	0.9	S	5
RR0099	Proseed	9-23	–	48	34	18	0.9	S	4
0923RR	Northstar	9-23	–	47	35	17	0.9	S	5
CX085RR	Dekalb	9-23	–	45	36	17	0.8	S	4
8094RR	Jung	9-23	–	45	35	17	0.9	S	5
RR 1211	Mallard	9-23	–	45	35	17	1.2	S	4
DS X-914	Dahlco	9-24	–	58	35	17	–	S	3
PB-1190RR	Prairie Brand	9-24	58	56	36	17	1.1	S	4
K-099A	KSC/Challenger	9-24	–	55	36	17	0.7	S	5

riety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
101+	KSC/Challenger	9-24	–	52	34	17	0.8	Rps1k	5
144RR	Kruger	9-24	–	50	35	17	1.2	S	4
90RR	Topfarm	9-24	–	50	36	17	0.9	S	4
7109RR	Ziller	9-24	52	48	35	17	1.0	S	5
-119RR	Mustang	9-24	–	47	36	16	1.1	Rps1k	2
-144RR	Mustang	9-25	58	53	35	17	1.4	S	4
9RR	Dahlman	9-25	–	52	32	18	0.9	Rps1k	5
F090RR	US Seeds	9-25	–	50	35	17	0.9	S	5
-1340RR	Prairie Brand	9-25	–	48	35	17	1.3	S	2
099RR	Kaltenberg	9-25	55	46	35	17	0.9	S	5
R-0920RR	PBR	9-26	–	57	35	17	0.8	S	4
4-M7RR	NK Brand	9-26	54	50	35	16	1.4	Rps1c	2
1173RR	Golden Harvest	9-26	–	46	35	17	1.1	S	4
2139RR	Wensman	9-26	–	46	35	17	1.3	S	3
-151RR	Mustang	9-27	–	58	33	17	1.5	Rps1c	3
41RR	Atlas	9-27	–	58	36	16	1.4	S	4–
P 1414RR	Sands	9-27	–	56	36	16	1.4	S	3
R-1620RR	PBR	9-27	–	55	33	17	1.5	Rps1c	4
1411RR	Golden Harvest	9-27	58	55	36	16	1.4	S	3
50RR	Topfarm	9-27	–	54	33	17	1.5	Rps1c	3
0159	Proseed	9-27	–	54	36	16	1.4	S	4
P 1519RR	Sands	9-27	–	54	36	17	1.5	S	3
7150RR	Ziller	9-28	–	65	33	17	1.3	S	S
9160RR	Garst	9-28	–	61	33	17	1.5	Rps1c	3
2159RR	Wensman	9-28	–	61	34	17	1.5	S	3
159RR	Renk	9-28	–	59	34	17	1.5	Rps1c	3
9143	Dahlco	9-28	–	58	36	17	–	S	3
161RR	Kaltenberg	9-28	–	57	33	17	1.3	Rps1c	4
R-1909RR	PBR	9-28	–	56	36	17	1.7	S	4
0934	Croplan	9-28	–	55	35	17	0.9	S	5
-1490RR	Prairie Brand	9-28	58	53	36	16	1.4	S	3
712RR	NK Brand	9-28	53	52	35	17	1.3	Rps1c	3
1702	Agripro	9-29	–	62	33	17	1.7	Rps1c	3
R-1404RR	PBR	9-29	–	56	35	17	1.4	Rps1k	3
150RR	Dekalb	9-29	–	56	36	16	1.5	S	4
139RR	Kaltenberg	9-29	–	54	36	16	1.3	S	5
155	KSC/Challenger	9-29	–	51	36	16	1.3	Rps1c	4
-1530RR	Prairie Brand	9-29	–	50	36	16	1.5	S	3
2148RR	Wensman	9-29	56	50	36	16	1.4	S	4
46RR	LG Seeds	9-29	–	49	34	17	1.4	Rps1k	3
9130RR	Garst	9-29	–	48	34	17	1.3	Rps1k	3
00-4	Stine	9-29	–	46	37	16	1.6	S	3
141	KSC/Challenger	9-30	–	57	34	17	1.2	S	5
1601	Asgrow	9-30	–	55	35	17	1.5	S	3
45RR	Garst	9-30	–	54	35	17	1.4	Rps1k	2
1RR	Thunder	9-30	–	53	34	17	1.1	S	4
-157RR	Latham	9-30	–	46	35	16	1.5	Rps1c	4
2002RR	Sansgaard	10-2	–	56	33	18	1.8	Rps1k	4
73RR	Atlas	10-2	–	56	36	17	1.7	S	5
202+RR	Yield King	10-2	–	56	36	16	1.8	S	5
198RR	Yield King	10-2	–	56	33	18	1.6	S	5
1923RR	Sansgaard	10-2	–	49	35	17	1.7	Rps1k	5

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
S-1810RR	Sansgaard	10-3	–	62	36	16	1.6	S	4
K-199RR	Kruger	10-4	61	55	35	17	1.7	S	4
K-191+RR	Yield King	10-4	–	53	36	16	1.6	S	5
S-1897RR	Sansgaard	10-4	–	50	36	16	1.7	S	5
K-202RR	Kruger	10-5	65	62	36	16	1.8	S	4
K-200RR	Yield King	10-5	–	57	35	16	1.8	S	3
LSD 20%			2	3					

Performance and characteristics of Roundup Ready soybean varieties, southern zone; Lamberton and Waseca, 1998, 1999.

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
S14-M7	NK Brand	9-21	–	49	34	18	1.4	Rps1c	2
91B91	Pioneer	9-22	54	46	33	18	1.7	S	3
H-1565RR	Golden Harvest	9-22	57	46	31	18	1.2	Rps1c	3
AP2102	Agripro	9-22	–	40	36	18	2.1	Rps1k	3
91B64	Pioneer	9-23	58	53	33	18	1.6	Rps1c	4
CX150RR	Dekalb	9-23	–	47	35	17	1.5	S	4
8152RR	Jung	9-24	–	55	32	18	1.5	Rps1c	3
R1685RR	Ramy	9-24	–	55	32	18	1.6	Rps1c	2
DS-9182	Dahlco	9-24	–	54	35	17	1.8	S	3
AP1702	Agripro	9-24	–	52	32	18	1.7	Rps1c	3
92B05	Pioneer	9-24	59	52	33	18	1.9	Rps1k	3
5173RR	Atlas	9-24	–	52	34	18	1.7	S	5
W2159RR	Wensman	9-24	–	51	32	18	1.5	S	3
6150RR	Topfarm	9-24	–	50	32	18	1.5	Rps1c	3
GL1501RR	Great Lakes	9-24	–	49	34	18	1.5	Rps1c	3
AG2001	Asgrow	9-24	–	49	34	18	2.0	S	4
2172RR	High Cycle	9-25	57	51	35	18	1.7	S	5
6199RR	LG Seeds	9-25	–	50	35	17	1.9	S	3
K-222+RR	Kruger	9-25	–	49	33	18	2.0	Rps1k	4
GL1902RR	Great Lakes	9-25	–	45	33	18	1.9	S	5
EX-347RR	Latham	9-25	–	45	34	17	1.9	S	5
DSR-215/RR	Dairyland	9-26	57	50	35	17	2.0	S	4
819ARR	Dahlman	9-26	–	50	35	17	1.9	S	4
PBR-2130XRR	PBR	9-26	–	49	34	17	2.1	Rps1k	3
919RR	Dahlman	9-26	–	47	33	18	1.9	S	4
2211RR	High Cycle	9-26	–	47	35	17	2.1	S	4
821RR	Dahlman	9-26	55	46	33	18	2.1	Rps1k	3
6218RR	Topfarm	9-26	–	45	33	18	2.1	Rps1k	4
3206RR	Dyna-Gro	9-26	–	45	34	17	2.0	S	4
6179RR	Topfarm	9-26	–	45	37	16	1.7	Rps1k	4
W2179RR	Wensman	9-26	–	45	34	18	1.7	S	4
AG2101	Asgrow	9-26	53	44	34	17	2.1	S	2
917RR	Dahlman	9-27	–	53	33	18	1.7	S	5
8221RR	Jung	9-27	–	52	35	17	2.1	S	4
EX-337RR	Latham	9-27	–	52	34	18	1.9	S	3
EXP 26024R	Ziller	9-27	–	51	35	17	1.9	S	4
DSR-197/RR	Dairyland	9-27	–	51	35	17	1.9	S	4
KB230RR	Kaltenberg	9-27	–	47	33	17	2.3	S	4

riety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
7190R	Ziller	9-27	–	47	34	18	1.9	S	4
(194RR	Dekalb	9-27	–	45	33	18	1.9	S	5
80RR	Topfarm	9-27	–	44	34	17	1.8	S	5
1999RR	Sansgaard	9-27	–	44	35	17	1.9	S	4
(9001RR	Thompson	9-27	–	44	34	17	2.3	S	3
(-207RR	Latham	9-28	–	54	35	17	1.8	S	4
-199RR	Mustang	9-28	–	54	33	17	1.9	S	3
92RR	Jung	9-28	–	54	33	17	2.0	S	3
)0RR	Viking	9-28	–	53	33	17	2.0	S	4
(B21	Pioneer	9-28	58	52	33	18	2.2	S	3
(-447RR	Latham	9-28	–	50	34	17	2.1	Rps1k	4
92RR	High Cycle	9-28	–	50	34	18	1.9	S	4
S S1809RR	US Seeds	9-28	–	50	33	18	1.8	S	4
54195	Profiseed	9-28	–	50	34	17	1.9	S	3
95RR	Cargill	9-28	–	49	33	18	1.9	S	4
5216RR	Terra	9-28	–	49	35	17	2.1	S	4
(9701RR	Thompson	9-28	–	48	33	17	2.0	S	4
(25RR	Cargill	9-28	–	46	34	17	2.2	Rps1c	4
)I 197RR	Sands	9-28	57	46	32	18	1.9	Rps1c	3
2198RR	Wensman	9-29	61	58	35	17	1.9	S	4
(3759RR	Thompson	9-29	–	53	34	17	1.9	S	3
(2-N2	NK Brand	9-29	–	52	35	17	2.2	S	4
)04RR	Northstar	9-29	–	52	33	18	2.0	S	4
52211	Mallard	9-29	–	52	34	17	2.2	S	4
980RR	Ramy	9-29	–	51	34	17	1.9	S	4
963RR	Anderson Seeds	9-29	–	50	35	17	2.0	S	3
2102RR	Sansgaard	9-29	–	50	34	17	2.1	S	5
14RR	Dyna-Gro	9-29	–	49	30	18	2.1	Rps1c	4
3R-2220XRR	PBR	9-29	–	49	34	18	2.2	Rps1	4
1207RR	Golden Harvest	9-29	54	48	30	18	2.0	Rps1c	3
S S2009RR	US Seeds	9-29	–	48	33	17	2.0	S	4
52301	Asgrow	9-29	53	46	35	17	2.3	S	3
3R-2520RR	PBR	9-29	–	46	34	17	2.5	Rps1	3
'2002	Agripro	9-29	–	45	31	18	2.0	Rps1c	3
34CNRR	Northstar	9-29	–	44	35	17	2.2	S	3
(9221RR	Garst	9-29	–	44	34	17	2.1	Rps1k	4
3R-241/RR	Dairyland	9-30	59	54	34	17	2.3	Rps1k	4
221	KSC/Challenger	9-30	–	54	33	18	2.0	S	5
920	Dahlco	9-30	–	53	33	18	2.0	S	5
8191RR	Golden Harvest	9-30	–	53	35	17	1.9	S	4
(198RR	Dekalb	9-30	–	52	34	17	1.9	S	4
1999	Croplan	9-30	–	52	34	17	1.9	S	4
202+RR	Yield King	9-30	–	51	35	17	1.8	S	5
91-4	Stine	9-30	59	51	33	17	2.1	S	4
1980RR	Terra	9-30	59	51	35	17	1.9	S	4
220RR	Yield King	9-30	–	51	35	17	2.0	Rps1	4
5215RR	Kaltenberg	9-30	–	51	34	18	2.1	S	5
-202RR	Mustang	9-30	57	51	35	17	2.0	S	4
-467RR	Latham	9-30	–	49	34	17	2.2	S	5
01-4	Stine	9-30	–	49	34	17	2.2	S	5
3215RR	Thompson	9-30	57	48	32	18	2.0	S	3
3228RR	Thompson	9-30	57	48	34	17	2.1	S	5

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre 98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score
5251RR	Atlas	9-30	–	48	34	17	2.4	S	4
PB-2097RR	Prairie Brand	9-30	–	48	35	17	2.0	S	4
PB-2397RR	Prairie Brand	9-30	–	48	34	17	2.3	S	4
H-1238RR	Golden Harvest	9-30	55	47	35	17	2.3	Rps1k	5
K-199RR	Yield King	9-30	58	47	34	17	1.7	S	4
2224RR	Northstar	9-30	–	47	35	17	2.2	S	4
PBR-1920RR	PBR	9-30	57	47	31	18	2.0	Rps1c	2
656RRBrand	Latham	9-30	55	47	34	18	2.3	Rps1k	5
X99-23	NK Brand	9-30	–	47	36	17	2.3	S	4
RS249RR	Renk	9-30	–	47	32	18	2.4	S	3
KB209RR	Kaltenberg	9-30	55	46	35	17	2.0	S	5
PB-2210RR	Prairie Brand	10-1	–	54	34	17	2.2	S	4
EX-437RR	Latham	10-1	–	51	34	17	2.1	S	5
EX-457RR	Latham	10-1	–	51	34	17	2.3	S	5
G2445RR	Midwest Seed	10-1	–	51	34	18	2.4	S	4
M-239RR	Mustang	10-1	–	50	34	17	2.3	Rps1k	4
R2200R	Renze	10-1	–	50	33	17	2.2	S	5
K-250	KSC/Challenger	10-1	–	49	35	17	2.2	S	4
WF230RR	Wilfarm	10-1	–	49	35	17	2.3	Rps1k	4
KB242RR	Kaltenberg	10-1	–	49	34	17	2.4	Rps1k	4
K-242RR	Kruger	10-1	57	49	33	18	2.2	Rps1k	5
RS208RR	Renk	10-1	–	49	34	17	2.0	S	4
R2509R	Renze	10-1	–	49	34	17	2.4	Rps1k	4
2506-4	Stine	10-1	–	49	34	17	2.4	Rps1k	4
EX9711RR	Thompson	10-1	–	49	36	17	2.3	S	4
GL2300RR	Great Lakes	10-1	–	48	34	17	2.3	Rps1k	3
S-2297RR	Sansgaard	10-1	–	48	33	18	2.2	S	4
W2219RR	Wensman	10-1	–	48	34	17	2.1	S	5
R2085RR	Ramy	10-1	–	48	34	17	2.0	S	3
PB-2430RR	Prairie Brand	10-1	–	48	34	17	2.4	Rps1k	3
CX242RR	Dekalb	10-1	–	46	34	17	2.4	S	4
R2400R	Renze	10-1	–	46	34	17	2.4	Rps1k	4
RR1911	Mallard	10-1	–	45	32	17	1.9	Rps1c	4
K-262RR	Kruger	10-1	56	45	34	18	2.4	S	5
S-2620RR	Sansgaard	10-2	–	57	35	17	2.4	Rps1	5
2300-4	Stine	10-2	–	55	33	18	2.3	S	4
K-240	KSC/Challenger	10-2	–	52	36	16	2.2	S	5
K-252	KSC/Challenger	10-2	–	51	34	17	2.3	S	3
K-222ARR	Yield King	10-2	–	51	34	17	2.0	S	5
EXP 2424RR	Sands	10-2	–	50	34	17	2.4	Rps1k	4
R2009R	Renze	10-2	57	50	34	17	2.0	S	4
3238RR	Dyna-Gro	10-2	–	49	34	17	2.3	Rps1k	5
3196RR	Dyna-Gro	10-2	–	49	34	17	1.9	S	4
K-266RR	Kruger	10-2	–	49	34	17	2.4	Rps1k	3
EX9196RR	Garst	10-2	–	46	32	18	1.9	Rps1c	3
M-229RR	Mustang	10-2	–	45	32	17	2.2	S	3
5242RR	Atlas	10-2	–	44	35	17	2.4	S	4
EXP 2392RR	Sands	10-2	–	42	33	18	2.3	S	3
SOI 248RR	Sands	10-3	–	48	35	17	2.4	S	5
TS2481RR	Terra	10-3	–	43	34	17	2.4	S	5
TS2481RR	Terra	10-3	–	43	34	17	2.4	S	5
LSD 20%			2	3					

erformance and characteristics of soybeans in soybean-cyst-nematode-infested (Lamberton, St. James and 'aseca) and non-infested (Fairmont, Lamberton and Waseca) sites, 1997-1999.

riety	Brand or Originator	Mature Date	Yield, Bushels/Acre: Infested Sites 97-99	Infested Sites 99-98	Infested Sites 1999	Non-Infested Sites 97-99	Non-Infested Sites 98-99	Non-Infested Sites 1999	Percent Protein	Percent Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating
300CN	Ramy	9-12	–	–	42	–	–	49	34	17	1.3	S	4	S
500CN	Ramy	9-12	–	–	32	–	–	47	33	18	1.5	S	3	R
3139N	Wensman	9-13	–	–	36	–	–	50	34	17	1.3	S	3	MR
-232CN	Latham	9-14	–	–	28	–	–	48	33	18	1.6	Rps1	4	R
rker	Minn. AES	9-15	42	42	39	48	51	53	34	18	1.5	Rps1	3	S
;R-150	Dairyland	9-15	–	–	39	–	–	50	35	17	1.5	Rps1	3	MR
:160C	Dekalb	9-15	49	49	39	49	51	48	33	19	1.6	S	4	MR
069	Asgrow	9-16	–	47	37	–	55	50	34	17	2.0	Rps1k	4	S
eborn	Minn. AES	9-16	48	50	43	48	50	49	35	17	1.6	Rps1	3	R
8-11	NK Brand	9-16	–	45	38	–	51	48	36	16	1.8	S	3	R
2444SCN	Yield King	9-17	–	–	38	–	–	54	35	17	2.2	Rps1k	4	S
1009	Iowa AES	9-17	–	–	42	–	–	53	33	18	2.1	S	3	MR
-1179CN	Mustang	9-17	–	–	40	–	–	52	34	17	1.7	S	5	MR
2222SCN	Yield King	9-17	–	–	42	–	–	52	36	16	2.0	S	5	S
l 201N	Sands	9-17	–	–	37	–	–	51	33	18	2.1	S	4	MR
l 188N	Sands	9-17	–	–	43	–	–	51	34	17	1.8	S	4	MR
12N	Mycogen	9-17	–	–	42	–	–	49	33	18	2.1	S	4	MR
1008	Iowa AES	9-17	–	–	41	–	–	49	34	17	2.1	S	4	MR
04CN	Northstar	9-17	–	–	39	–	–	48	33	18	1.8	S	3	MR
'2121	Agripro	9-17	–	–	42	–	–	45	34	17	2.1	S	3	MR
2220SCN	Kruger	9-18	46	45	31	55	57	53	34	17	2.0	Rps1k	4	MR
02CN	Northstar	9-18	–	49	41	–	55	53	34	17	1.8	S	3	MR
82-1	Stine	9-18	51	50	41	55	57	53	34	17	1.9	S	3	MR
9SCN	Trelay	9-18	–	–	37	–	–	53	36	16	2.2	S	4	S
-188CN	Prairie Brand	9-18	51	50	41	–	–	52	34	17	1.8	S	4	S
-2209CN	Mustang	9-18	–	–	38	–	–	51	33	17	2.0	S	5	MR
S229	US Seeds	9-18	–	–	37	–	–	51	33	18	2.2	S	3	MR
81	Kaltenberg	9-18	–	–	38	–	–	50	35	17	1.8	S	3	MR
1919SCN	Kruger	9-18	–	–	39	–	–	50	34	17	1.7	S	3	MR
B35	Pioneer	9-18	–	–	42	–	–	50	33	18	2.3	Rps1	3	MR
S189	US Seeds	9-18	–	–	42	–	–	50	35	17	1.8	S	3	MR
2121SCN	Yield King	9-18	–	–	33	–	–	50	34	17	1.9	S	4	MR
232SCN	Yield King	9-18	–	–	37	–	–	50	33	18	2.1	S	2	S
2201	Asgrow	9-18	–	48	39	–	53	49	33	18	2.2	Rps1k	3	MR
207C	Dekalb	9-18	–	–	33	–	–	49	35	17	2.0	S	2	R
34	Pioneer	9-18	48	47	38	51	52	49	34	17	2.2	Rps1	3	R
340RRCN	Ramy	9-18	–	–	35	–	–	49	34	17	2.3	S	2	MR
9181N	Garst	9-18	–	–	40	–	–	48	35	17	1.8	S	–	MR
2272	Golden Harvest	9-18	–	–	42	–	–	48	34	17	2.2	S	3	MR
2CN BRAND	Latham	9-18	–	49	43	–	54	48	33	17	1.9	S	5	MR
3189N	Wensman	9-18	–	–	41	–	–	48	34	17	1.8	S	3	MR
235C	Dekalb	9-18	51	51	43	51	52	47	33	17	2.3	S	3	MR
2020SCN	Kruger	9-19	–	–	42	–	–	55	34	17	1.8	S	4	MR
R-234CN	PBR	9-19	–	–	48	–	–	54	34	18	2.3	S	5	MR
-222CN	Prairie Brand	9-19	–	–	42	–	–	54	36	16	2.2	S	4	MR
2520SCN	Kruger	9-19	–	–	37	–	–	53	34	17	2.3	S	3	-
239RR	Renk	9-19	–	–	30	–	–	51	34	17	2.3	S	3	S
2021	Iowa AES	9-19	47	46	39	53	55	51	33	18	2.1	Rps1k	3	S
-2309NRR	Renk	9-19	–	–	35	–	–	49	34	17	2.3	S	3	MR
3236CN	Thompson	9-19	–	54	48	–	54	49	33	17	2.2	S	4	MR

Variety	Brand or Originator	Mature Date	Yield, Bushels/Acre: Infested Sites 97-99	99-98	1999	Non-Infested Sites 97-99	98-99	1999	Percent Protein	Oil	Maturity Rating	Phytophthora Gene	Chlorosis Score	SCN Rating
3231NRR	Dyna-Gro	9-19	–	–	39	–	–	48	34	17	2.3	S	3	S
X 92348RR	Golden Harvest	9-19	–	–	35	–	–	45	34	17	2.3	S	3	MR
KB230RR	Kaltenberg	9-19	–	–	35	–	–	45	34	17	2.3	S	4	MR
IA2036	Iowa AES	9-19	47	46	39	49	50	45	34	17	2.2	Rps1k	3	MR
EX-527RRN	Latham	9-20	–	–	35	–	–	47	34	17	2.3	S	4	MR
D259N	Garst	9-20	–	–	34	–	–	46	33	17	2.4	S	3	MR
6222CRR	LG Seeds	9-20	–	–	40	–	–	46	34	17	2.2	S	3	MR
2402-2	Stine	9-21	–	–	34	–	–	45	33	18	2.4	S	5	MR
LSD 20%			1	1	2	1	1	2						

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Shelly, 1999.

Brand or Originator	Variety	White Mold Incidence (%) Average	Minimum	Maximum	Yield, Bu/Acre
N. D. AES	Daksoy	1.6	0.0	4.4	53.4
Minn. AES	Glacier	1.6	0.0	2.5	51.5
Minn. AES	McCall	2.9	1.0	7.0	37.8
N. D. AES	Traill	5.3	1.0	15.0	43.4
Minn. AES	Agassiz	7.1	2.5	16.0	51.4
Prairie Brand Research	PBR030RR	7.4	2.2	12.0	47.5
Dekalb	CX046	7.8	2.0	17.6	36.9
Croplan Genetics	L0292	25.1	10.0	50.0	57.2
Prairie Brand	PB098	32.1	4.2	50.0	35.4
Minn. AES	MN0301	35.4	10.5	60.0	36.9
LSD 20%		10.5			6.9

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Rosemount, 1999.

Brand or Originator	Variety	White Mold Incidence (%) Average	Minimum	Maximum	Yield, Bu/Acre
Pioneer	9163	4.2	0.0	7.5	46.0
Minn. AES	MN0301	4.7	0.0	8.8	44.4
Minn. AES	Toyopro	5.7	0.0	11.3	44.5
Minn. AES	Evans	7.1	0.0	15.0	40.7
Novartis	S14-M7	9.5	6.5	13.8	50.4
Golden Harvest	H1103	9.6	5.7	15.0	45.6
Prairie Brand	PB-146	9.6	7.1	11.3	58.8
Minn. AES	Parker	9.7	7.5	11.1	40.4
Minn. AES	Lambert	9.7	2.5	22.5	49.6
Minn. AES	Minnatto	9.8	7.8	11.3	34.9
Novartis	X9818	11.4	8.6	15.4	47.2
Stine	1296-4	11.7	7.7	14.5	53.5
Pioneer	91B53	11.8	7.5	16.3	50.6
Novartis	X9814	11.8	0.0	30.0	46.3
Asgrow	AG1934	12.0	2.7	15.8	43.6
Prairie Brand Research	PBR1404	12.3	1.4	21.3	49.4
Latham	EX157RR	13.2	6.5	17.6	45.5
Pioneer	91B64RR	13.9	8.6	20.5	48.1
Minn. AES	Kato	14.1	11.5	17.1	42.1

and or Originator	Variety	White Mold Incidence (%) Average	Minimum	Maximum	Yield, Bu/Acre
nn. AES	MN1301	15.8	2.5	30.8	45.4
nds	SOI 098	15.9	9.9	20.0	58.6
tham	140 Brand	18.2	13.8	23.8	48.4
oneer	91B52RR	20.0	6.3	36.1	44.9
AP Midwest(Dynagrow)	3149RR	22.1	11.3	38.8	35.8
airie Brand	PB-1709RR	43.7	27.5	75.0	36.6
D 20%		7.1			6.7

erformance of public and private soybean varieties in order of usceptibility to white mold infection, Byron, 1999.

and or Originator	Variety	White Mold Incidence (%) Average	Minimum	Maximum	Yield, Bu/Acre
oneer	9163	2.2	0.0	3.8	24.3
ripro	AP394	2.8	0.0	5.0	40.1
grow	AG2001	3.8	1.3	5.0	44.0
kalb	CX195	4.4	3.8	5.0	48.1
ne	2500	6.6	1.3	10.0	48.7
ompson	T-3203	6.6	0.0	12.5	59.1
grow	AG2501	8.1	2.5	17.5	43.1
oneer	91B53	8.8	0.0	25.0	44.4
ompson	T-3184	8.8	0.0	17.5	59.9
rthstar	1903	11.0	1.3	25.0	54.4
eat Lakes Hybrids	GL1715	11.0	1.3	21.3	49.5
vartis	X9818	11.3	5.0	22.5	48.9
iryland	DSR218	11.9	7.5	20.0	38.2
grow	AG1901	11.9	0.0	40.0	34.9
ited Suppliers	US S199	12.2	6.3	20.0	52.8
nd	SOI 144	13.5	0.0	35.0	59.0
va AES	IA1006	14.1	3.8	22.5	34.8
oneer	91B52RR	14.7	2.5	25.0	41.7
mestic Seed	M-1190	14.7	2.5	30.0	50.4
oneer	91B64RR	15.0	5.0	30.0	42.2
tham	H-1184	16.0	10.0	20.0	45.1
nd	SOI 260	16.0	10.0	20.0	58.9
airie Brand	PB-227	16.3	5.0	30.0	46.4
AP Midwest(Dynagrow)	3206RR	16.9	6.3	30.0	31.6
tham	EX-447RR	17.2	10.0	25.0	38.1
nn. AES	Granite	17.2	10.0	30.0	36.9
AP Midwest(Dynagrow)	3231RR	18.8	2.5	30.0	33.0
kalb	CX166	18.8	5.0	30.0	51.1
airie Brand	PB-194	18.8	2.5	50.0	54.6
iryland	DSR215RR	21.0	11.3	30.0	25.2
vartis	S22-N2	21.0	15.0	30.0	40.8
va AES	IA2021	21.3	10.0	30.0	41.6
tham	EX-347RR	22.5	20.0	27.5	36.5
ompson	EX8146	22.5	12.5	40.0	51.5
rthstar	1904RR	23.8	15.0	30.0	40.5
ng	1174 WM	24.1	0.0	43.8	42.1
nn. AES	MN1801	24.7	10.0	35.0	42.8
tham	406RR	26.6	10.0	40.0	37.4
vartis	X9923	26.9	15.0	37.5	38.1

Brand or Originator	Variety	White Mold Incidence (%)			Yield,
		Average	Minimum	Maximum	Bu/Acre
Dairyland	DSR173	27.2	2.5	62.5	40.6
UAP Midwest(Dynagrow)	3238RR	34.1	10.0	50.0	34.5
Minn. AES	Sturdy	35.6	15.0	65.0	38.5
Dekalb	CX198RR	52.5	0.0	93.8	40.3
Prairie Brand Research	PBR1909RR	63.5	50.0	78.8	24.9
Golden Harvest	X8191RR	68.2	38.8	93.8	31.0
LSD 20%		12.2			12.3

Performance of public and private soybean varieties in order of susceptibility to white mold infection, Danube, 1999.

Brand or Originator	Variety	White Mold Incidence (%)			Yield,
		Average	Minimum	Maximum	Bu/Acre
Sand	SOI 260	0.0	0.0	0.0	25.7
Thompson	T-3203	0.8	0.0	2.5	44.5
Jung	1174 WM	1.9	0.0	7.5	41.7
Sand	SOI 144	2.5	0.0	10.0	47.7
Latham	H-1184	3.8	0.0	7.5	37.6
Thompson	T-3184	3.8	0.0	10.0	38.8
United Suppliers	US S199	3.8	0.0	7.5	36.9
Pioneer	9163	4.4	0.0	10.0	47.6
Iowa AES	IA2021	4.4	0.0	10.0	35.9
Asgrow	AG2501	5.6	0.0	17.5	36.6
Dairyland	DSR-173	5.6	0.0	17.5	40.2
Northstar	1903	6.3	0.0	15.0	49.8
Great Lakes Hybrids	GL1715	6.3	0.0	15.0	45.9
Minn. AES	MN1801	6.3	0.0	17.5	39.0
Prairie Brand	PB-227	6.3	0.0	12.5	32.3
Prairie Brand	PB-194	6.9	0.0	10.0	39.7
Agripro	AP1394	8.1	0.0	25.0	45.3
Domestic Seed	M-1190	8.1	0.0	15.0	41.0
Minn. AES	Granite	8.8	0.0	15.0	26.6
Latham	406RR	9.4	0.0	25.0	43.2
Asgrow	AG2001	9.4	5.0	17.5	49.4
Pioneer	91B53	10.0	0.0	20.0	52.3
Pioneer	91B64RR	10.0	0.0	15.0	49.8
Novartis	X9818	10.0	0.0	22.5	37.8
Stine	2500	10.6	0.0	27.5	44.5
Thompson	EX8146	10.6	0.0	25.0	42.1
Iowa AES	IA1006	10.6	5.0	20.0	46.3
Dekalb	CX-166	11.3	0.0	37.5	50.2
Dekalb	CX-195	11.3	0.0	22.5	46.6
Novartis	S22-N2	11.9	0.0	40.0	41.3
Asgrow	AG1901	12.5	0.0	30.0	38.2
Latham	EX-447RR	12.5	0.0	35.0	44.2
UAP Midwest(Dynagrow)	3238RR	15.6	5.0	37.5	39.7
Dairyland	DSR-218	16.9	0.0	45.0	50.1
Novartis	X9923	16.9	0.0	30.0	33.5
Minn. AES	Sturdy	18.1	7.5	25.0	35.5
UAP Midwest(Dynagrow)	3206RR	18.8	0.0	40.0	40.9
Prairie Brand Research	PBR1909RR	20.6	0.0	45.0	32.7
Dairyland	DSR-215	22.5	5.0	40.0	41.8

ınd or Originator	Variety	White Mold Incidence (%) Average	Minimum	Maximum	Yield, Bu/Acre
ham	EX-347RR	23.1	0.0	37.5	38.2
ıneer	91B52RR	28.1	10.0	50.0	37.8
P Midwest(Dynagrow)	3231NRR	31.3	10.0	60.0	39.5
kalb	CX-198R	35.6	20.0	62.5	42.0
lden Harvest	X8191RR	37.5	30.0	57.5	28.3
rthstar	1904RR	40.6	17.5	52.5	35.0
D 20%		9.4			8.3

erformance of special-use soybean varieties, 1997-1999.

riety	Releasing Institution	Mature Date	Yield, Bushels/Acre 1997-99	1998-99	1999	Percent Protein	Oil
rthern Zone, 1997,1998 Morris and Rosemount; 1999 Crookston, Moorhead and Shelly							
ı	N.D. AES	9-20	–	–	31	34	17
assiz	Minn. AES	9-24	37	40	34	34	17
13	Minn. AES	9-24	34	39	37	34	17
rpro	N.D. AES	9-26	–	–	35	36	15
natto	N.D. AES	10-1	36	39	31	32	17
nnatto	Minn. AES	10-4	32	34	29	36	14
uthern Zone, Lamberton and Waseca							
rker	Minn. AES	9-22	–	48	46	34	17
006	Iowa AES	9-25	50	51	50	33	17
007	Iowa AES	9-28	–	47	41	35	17
005	Iowa AES	9-30	–	52	49	34	17
012	Iowa AES	9-30	–	47	40	35	17
204	Iowa AES	9-30	–	43	38	36	17
041	Iowa AES	10-1	–	–	43	37	16
016	Iowa AES	10-1	44	44	41	36	17
042	Iowa AES	10-1	–	–	41	37	16
ıton 81	Iowa AES	10-1	–	42	40	36	17
023	Iowa AES	10-1	–	38	35	37	15
035	Iowa AES	10-1	–	37	32	36	16
019	Iowa AES	10-2	–	50	44	34	18
040	Iowa AES	10-2	–	–	43	35	17
011	Iowa AES	10-2	–	48	36	34	18
025	Iowa AES	10-2	–	42	36	37	16
017	Iowa AES	10-2	42	42	34	36	17
034	Iowa AES	10-3	50	51	44	36	16
033	Iowa AES	10-3	–	43	40	36	17
029	Iowa AES	10-3	–	41	38	36	17
032	Iowa AES	10-3	–	44	38	36	17
027	Iowa AES	10-3	–	41	35	36	17
024	Iowa AES	10-3	–	34	32	36	16
028	Iowa AES	10-4	–	46	39	35	17
030	Iowa AES	10-4	–	44	38	36	16
020	Iowa AES	10-4	43	44	36	35	17
D 20%			2	3	4		

Performance of special-use soybean varieties, 1999.

Variety	Releasing Institution	Maturity Rating	Special Characteristics	Hilum Color	Phytophthora Gene	Chlorosis Score	Seeds/Pound
Northern Zone, 1997,98 Morris and Rosemount, 1999 Crookston, Moorhead and Shelly							
Jim	N.D. AES	00.0	General Purpose	Yellow	S	3	2,671
Agassiz	Minn. AES	0.0	General Purpose	Buff	Rps1	3	3,027
UM3	Minn. AES	0.3	Small Seed	Yellow	Rps1	3	5,675
Norpro	N.D. AES	0.4	High Protein	Yellow	S	3	2,671
Danatto	N.D. AES	0.4	Small Seed	Yellow	S	3	5,044
Minnatto	Minn. AES	0.7	Small Seed	Yellow	Rps1	3	5,044
Southern Zone, Lamberton and Waseca							
Parker	Minn. AES	1.6	General Purpose	Buff	Rps1	4	2,522
IA1006	Iowa AES	1.6	General Purpose	Black	S	3	2,838
IA1007	Iowa AES	1.9	Large Seed	Yellow	–	3	1,681
IA1005	Iowa AES	1.9	Large Seed,High Protein	Yellow	–	2	2,389
IA2012	Iowa AES	2.2	Large Seed	Yellow	–	4	1,746
HP204	Iowa AES	2.0	Large Seed,High Protein	Yellow	–	3	2,162
IA2041	Iowa AES	2.1	Large Seed,High Protein	Yellow	–	4	2,389
IA2016	Iowa AES	2.2	Large Seed,High Protein	Yellow	–	3	2,162
IA2042	Iowa AES	2.1	Large Seed,High Protein	Yellow	–	4	2,064
Vinton 81	Iowa AES	2.0	Large Seed,High Protein	Yellow	Rps1c	3	2,064
IA2023	Iowa AES	2.4	Small Seed	Yellow	–	4	6,486
IA2035	Iowa AES	2.4	Small Seed	Yellow	–	3	6,486
IA2019	Iowa AES	2.2	Large Seed	Yellow	–	4	1,892
IA2040	Iowa AES	2.4	Large Seed,High Protein	Yellow	–	4	1,681
IA2011	Iowa AES	2.2	Lacks Lipoxygenase 2	Yellow	–	3	2,522
IA2025	Iowa AES	2.4	Lipoxygenase Free	Yellow	–	3	2,162
IA2017	Iowa AES	2.2	Large Seed,High Protein	Yellow	–	5	2,389
IA2034	Iowa AES	2.5	Large Seed,High Protein	Yellow	–	4	2,270
IA2033	Iowa AES	2.4	Lipoxygenase Free	Yellow	–	4	2,162
IA2029	Iowa AES	2.4	Lipoxygenase Free	Yellow	–	5	2,270
IA2032	Iowa AES	2.5	Lipoxygenase Free	Yellow	–	3	2,064
IA2027	Iowa AES	2.4	Lipoxygenase Free	Yellow	–	4	2,162
IA2024	Iowa AES	2.5	Small Seed	Yellow	–	2	6,486
IA2028	Iowa AES	2.4	Lipoxygenase Free	Yellow	–	4	2,162
IA2030	Iowa AES	2.3	Lipoxygenase Free	Yellow	–	4	2,162
IA2020	Iowa AES	2.3	Large Seed,High Protein	Yellow	–	4	2,064

Public developed soybean varieties entered in 1999 tests.

Variety	Releasing Institution	Maturity Rating	Phytophthora Gene	BSR Reaction	SCN Reaction	Chlorosis Score
Daksoy	N.D. AES	00.6	S	S	S	4
McCall	Minn. AES	00.7	S	S	S	3
Jim	N.D. AES	00.7	S	S	S	4
Glacier	Minn. AES	00.8	Rps6	S	S	4
Agassiz	Minn. AES	0.0	Rps1	S	S	3
Traill	N.D. AES	0.0	S	S	S	4
Ozzie	Minn. AES	0.3	Rps1	S	S	3
MN0301	Minn. AES	0.3	Rps1	S	S	3
Council	N.D. AES	0.5	Rps1	S	S	3
Evans	Minn. AES	0.6	Rps1	S	S	4
Lambert	Minn. AES	0.8	Rps1	S	S	3
Hendricks	Minn. + S.D. AES	0.9	Rps1	S	S	4
Surge	S.D. + Minn. AES	0.9	Rps1	S	S	4
MN0901	Minn. AES	0.9	Rps1	S	S	4

iety	Releasing Institution	Maturity Rating	Phytophthora Gene	BSR Reaction	SCN Reaction	Chlorosis Score
o	Minn. AES	1.3	Rps1	S	S	3
I1301	Minn. AES	1.3	Rpslc	S	S	3
I1401	Minn. AES	1.4	Rps1	S	S	3
ker	Minn. AES	1.5	Rps1	S	S	4
006	Iowa AES	1.6	S	R	S	4
eborn	Minn. AES	1.6	Rps1	R	R	4
t	Minn. AES	1.8	Rps1	S	S	4
ınite	Minn. AES	1.8	Rps1	R	S	4
I1801	Minn. AES	1.8	Rps1	S	S	4
ibault	Minn. AES	1.9	Rps1	R	R	4
her	Iowa AES	1.9	Rps1k+Rps6	R	S	2
008	Iowa AES	1.9	S	S	R	4
din 91	Iowa AES	2.0	Rps1k	S	S	4
rdy	Minn. AES	2.0	Rps1	S	S	3
021	Iowa AES	2.1	Rpslk	S	S	4
008R	Iowa AES	2.1	Rpslk	R	S	3
009	Iowa AES	2.1	S	S	R	3
036	Iowa AES	2.1	S	S	R	3
038	Iowa AES	2.3	S	S	S	4

ources of Registered and Certified Seed

llowing are sources of Registered and Cer-ed seed of crop varieties grown for certifi-ion in Minnesota in 1999. Fields of these d growers were inspected by Minnesota op Improvement Association (MCIA).

be eligible for final certification the d produced on these fields must be sam-d, tested and inspected by MCIA after ıditioning. The term "certified" is ɔadly applied to three classes of seed, undation, Registered and Certified. gistered seed is grown from Foundation d and Certified seed is usually grown m Registered seed, though Certified d of some varieties is grown directly m the Foundation seed class.

rtified seed transported across state lines ıst comply with the stipulations of the deral Seed Act and with seed laws and ;ulations of the state into which it is nsported. Seed tagged with MCIA cer-cation tags or for which an MCIA bulk certification certificate has been issued has been grown, conditioned, sampled and tested according to MCIA regulations and meets applicable requirements of the Minnesota Department of Agriculture.

Should you ever suspect misrepresentation, mislabeling or violation of regulations under which certified seed classes are produced and marketed, contact Minnesota Crop Improvement Association, 1900 Hendon Avenue, St. Paul, MN 55108.

Prospective buyers of seed from growers in the list that follows should contact growers directly for information about seed quantity and price.

This listing is provided as a service to prospective seed buyers. It is not to be construed as an offer for sale by the grower and is not to be considered as public advertising or as the posting of public notice in any manner. Growers who wish to promote and sell seed in Minnesota must comply with all current state regulations governing the sale of seed.

Notice to Seed Buyers

While MCIA cannot assume financial responsibility for the performance of seed listed in this directory or for disagreements over sales that may arise from this list any complaint about certified seed addressed to MCIA will be investigated. Should a claim over seed performance involving MCIA arise, it must be addressed as provided in Minnesota Department of Agriculture Rules for Arbitration of Seed Performance Disputes. It is the responsibility of the seller of certified seed to supply seed representative of the samples submitted and approved for certification by MCIA. Purchasers of seed should insist on certification being complete, with certified seed tags attached to bags or a bulk sale certificate issued for bulk seed lots.

ting lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

ARLEY

cel

/	Beedy Farms, Inc., Moorhead	218-236-8082	C
son	Weinlaeder Seed Company, Drayton, N.D.	701-454-6427	C
shall	Sczepanski, Thomas, Stephen	218-478-2462	R

gan

stone	Skyline Production System, Woodstock	507-777-4262	R

VBrite

born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C

Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Marshall	Gostanzik, Stan, Argyle	218-437-8149	R
Marshall	Robertson Brothers, Argyle	218-437-6411	R
Otter Tail	Brenden, Selvin C., Rothsay	218-867-2134	C
Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C
Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Red Lake	Vatthauer, Clarence & David, Red Lake Falls	218-253-2476	C

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Robust

Carlton	Korhonen,Art, Kettle River	218-273-4931	C
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Clay	Olek, Bradley, Felton	218-494-3440	C
Clay	Olek, Vernard, Felton	218-494-3440	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Freeborn	Albert Lea Seed House, Inc.,Albert Lea	507-373-3161	C
Grant	Adams Seed, Wendell	218-458-2151	C
Kandiyohi	Behm Seed Company,Atwater	320-974-3003	C R
Mahnomen	Pazdernik Farms, Inc.,Waubun	218-473-2232	C
Marshall	Anderson, Harvey & Luther, Stephen	218-455-3305	R
Marshall	Double A Farms,Viking	218-523-4246	C
Marshall	Sczepanski,Thomas, Stephen	218-478-2462	R
Meeker	Peterson, Melvin,Atwater	320-877-7585	C
Meeker	Peterson, Russell M., Grove City	320-877-7793	C
Meeker	Wigen, Marlow E., Litchfield	320-693-8182	C
Mille Lacs	Schimming, Mike & Walter, Princeton	612-389-2679	C
Murray	Blankers, Jerry, Lake Wilson	507-879-3103	C
Norman	Chisholm, Keith P., Gary	218-356-8674	C
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Otter Tail	Wehking, Delmar, Parkers Prairie	218-338-2161	C
Polk	Clementson, Jon, Erskine	218-687-2345	C
Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	C
Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	C
Polk	Mat - Co., Inc., Fosston,	218-435-6667	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Roseau	Habstritt Farms, Inc., Roseau	218-463-1193	C
Stearns	Jokeland Farms, Holdingford	320-746-2147	C
Stearns	Nietfeld Farm, Inc., Melrose	320-987-3442	C
Todd	Brekke, Floyd, Eagle Bend	218-738-2672	C
Todd	Faust, Kevin, Long Prairie	320-732-3361	C
Washington	Wagner, W.V., Hastings	651-437-5718	C
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	C R
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C

Royal

Freeborn	Albert Lea Seed House, Inc.,Albert Lea	507-373-3161	C
Pipestone	Skyline Production System,Woodstock	507-777-4262	R
Pipestone	Zeinstra, Michael, Holland	507-347-3342	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	R
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C R

Stander

Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Goodhue	Ag Partners Co-op, Goodhue	651-923-4496	C
Goodhue	Buck, Don, Zumbrota	507-732-5186	C
Grant	Adams Seed,Wendell	218-458-2151	C
Grant	Lacey Company, Gerald A.,Wendell	218-458-2595	R
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Marshall	Jensen Seed Company, Stephen	218-478-3397	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	R
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C
Pennington	Asp, Kenneth,Thief River Falls	218-681-3272	C
Pipestone	Spronk,Art & Sons Seed Farm, Edgerton	507-442-5334	C
Wright	Hopkins, Joseph, Buffalo	612-682-1868	C

BEANS

Envoy Navy

Marshall	Jensen Seed Company, Stephen	218-478-3397	R

Frontier Pinto

Polk	Mack Farms, Inc., Ron, East Grand Forks	218-773-2601	R

Maverick Pinto

Grant	Kapphahn, John M., Elbow Lake	218-685-4604	C
Polk	Thorson Farm, Inc.,J. O., East Grand Forks	218-893-2285	C

Montcalm Red Kidney

Otter Tail	Wehking, Delmar, Parkers Prairie	218-338-2161	C

Norstar Navy

Grant	Kapphahn, John M., Elbow Lake	218-685-4604	R

BIG BLUESTEM

Bison

Roseau	Baumgartner Farms, Inc., Roseau	218-463-1332	C

BIRDSFOOT TREFOIL

Norcen

Lake Of Woods	Pieper, Danny, Williams	218-783-4352	C R
Lake Of Woods	Pieper, Robert, Williams	218-783-4352	C R
Roseau	Solberg, Richard, Greenbush	218-782-2107	R
Roseau	Svoboda - Transgrud, Badger	218-528-3692	R

CANADA WILDRYE

Mandan

Marshall	Hapka Seed Farm,Argyle	218-437-6603	C
Roseau	Baumgartner Farms, Inc., Roseau	218-463-1332	C

CANOLA

Golden Boy

Wilkin	Seeds 2000, Breckenridge	218-643-2410	C

Quantum

Out of state	Interstate Payco Seed Co, West Fargo, N.D.	701-282-7338	C

CICER MILKVETCH

Windsor

Kittson	Carlson, Oscar T., Lake Bronson	218-754-4475	C

CORN

E580 Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E585Bt Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E590 Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E605Bt Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E606 Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E670A Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E670ABt Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E699RR Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

E805 Hybrid

Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C

CROWNVETCH

Penngift

Lake Of Woods	Tveit Farms, Roosevelt	218-442-5281	C

DURUM WHEAT

Belzer

Marshall	Sczepanski,Thomas, Stephen	218-478-2462	R

Maier

Marshall	Sczepanski,Thomas, Stephen	218-478-2462	R

ting lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

ountrail			
rshall	Sczepanski, Thomas, Stephen	218-478-2462	R

ELD PEAS

ırneval			
estone	Skyline Production System, Woodstock	507-777-4262	R
tegra			
estone	Skyline Production System, Woodstock	507-777-4262	R
apper			
rshall	Riopelle, Jack L., Argyle	218-437-8147	R

AX

Emerson			
tson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C
ambina			
tson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	R

IDIANGRASS

ımahawk			
seau	Baumgartner Farms, Inc., Roseau	218-463-1332	C

ENTUCKY BLUEGRASS

innfine			
seau	Habstritt Farms, Inc., Roseau	218-463-1193	C
seau	Marvin's, Warroad	218-386-1333	C
ark			
ce Of Woods	Pieper Farms, Jerry, Williams	218-783-6610	C
ce Of Woods	Pieper, Robert, Williams	218-783-4352	C
seau	Eastman, Bob, Roseau	218-463-2873	C
seau	Eastwood Estates, Roseau	218-424-7509	C
seau	Evergreen Farms of Roseau, Roseau	218-425-7432	C
seau	Goos Farms, Inc., Roseau	218-424-7748	C
seau	Grahn Farms, c/o Mike Grahn, Roseau	218-463-1765	C
seau	Grahn, Greg R., Warroad	218-463-3570	C
seau	Habstritt Farms, Inc., Roseau	218-463-1193	C R
seau	Hagen, L & L Farms, Inc., Badger	218-528-3523	C
seau	Hagen, William, Warroad	218-386-1400	C
seau	Johnson Seed Farms, Inc., Salol	218-424-7269	C
seau	Johnson, Rodney, Alexandria	320-589-1003	C
seau	Johnson, Steve, Roseau	218-424-7070	C
seau	Lund, Ludvig, Roseau	218-463-1029	C
seau	Magnusson Farms, Roseau	218-463-2374	C
seau	Magnusson, Ardell, Roseau	218-463-1647	C
seau	Marvin's, Warroad	218-386-1333	C
seau	Miller, Scott, Warroad	218-386-1739	C
seau	Millner Farms, Gene Millner, Roseau	218-463-2164	C
seau	Northern Minnesota Bluegrass, Roseau	218-463-1179	C R
seau	Olafson, Mark, Roseau	218-463-3958	C
seau	Santl Farms, Roseau	218-463-2686	C
seau	Slater, Gary, Roseau	218-463-1064	C
seau	Swanson, Leslie, Roseau	218-463-2702	C
seau	Wahlberg, John, Roseau	218-386-2453	C

ATS

elle			
ıe Earth	Ramy Seed Co., Michael Ramy, Mankato	507-387-4091	C
ıy	Tobolt Seed, Moorhead	218-287-2904	C
kota	May, Jr., William, Farmington	612-463-8541	C
ıdge	Wright Seed Service, West Concord	507-527-2737	C
ıuglas	Thompson Farms, Kensington	320-965-2486	C
eborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
odhue	Tri, Robert R., Zumbrota	507-732-7153	C
ndiyohi	Behm Seed Company, Atwater	320-974-3003	C
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Otter Tail	Peeters, John, Menahga	218-385-2609	C
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Blaze			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Chaps			
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Dane			
Faribault	Watonwan Farm Service, Kiester	507-294-3697	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Goodhue	Tri, Robert R., Zumbrota	507-732-7153	C
Houston	Troendle Farms, Spring Grove	507-724-2211	C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C
Kandiyohi	Bredeson Seed Farm, Willmar	320-235-7315	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Corning Seed & Supply Inc., Austin	507-433-9002	C
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C
Otter Tail	Peeters, John, Menahga	218-385-2609	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C
Gem			
Brown	Cunningham Seed Farms, Sleepy Eye	507-794-7323	C
Dodge	Wright Seed Service, West Concord	507-527-2737	C
Faribault	Watonwan Farm Service, Kiester	507-294-3697	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Houston	Shooting Star Native Seeds, Spring Grove	507-498-3993	C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
Lyon	Tholen Seeds, Tracy	507-629-3505	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Smith, Steven, Darwin	320-693-6769	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Corning Seed & Supply Inc., Austin	507-433-9002	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Otter Tail	Peeters, John, Menahga	218-385-2609	C
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
Renville	Kiecker Seed Company, Hector	507-426-8167	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C
Stearns	Krippner, Joe, Richmond	320-597-4442	C
Stearns	Nietfeld Farm, Inc., Melrose	320-987-3442	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Todd	Perish Farms, Inc., Browerville	320-594-6586	C
Todd	Schwanke, Lloyd, Grey Eagle	320-285-5417	C
Wabasha	Dill Company, John M. Evers, Wabasha	651-565-2611	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C
Jerry			
Brown	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Carlton	Korhonen, Art, Kettle River	218-273-4931	C
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Clearwater	Fredrickson Farms, Donald, Bagley	218-694-2732	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Goodhue	Ag Partners Co-op, Goodhue	651-923-4496	C

Goodhue	Tri, Robert R., Zumbrota	507-732-7153	C R
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	C R
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C R
Marshall	Newfolden Co-op Elevator Assn., Newfolden	218-874-7465	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Mower	Corning Seed & Supply Inc., Austin	507-433-9002	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C R
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Pine	Cabak, Daniel C., Hinckley	320-384-7377	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C R
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
Renville	JSF, Inc., Sacred Heart	320-765-2225	R
Rice	Werner Farm Seeds, Dundas	507-645-7995	C
Rice	Werner, Eugene, Dundas	507-645-7995	R
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Swift	Nelson Seed Company, Benson	320-843-3610	C
Todd	Faust, Kevin, Long Prairie	320-732-3361	C
Wabasha	Dill Company, John M. Evers, Wabasha	651-565-2611	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C

Jim

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Goodhue	Ag Partners Co-op, Goodhue	651-923-4496	C
Goodhue	Buck, Don, Zumbrota	507-732-5186	C
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	C
Le Sueur	Sapp Farms c/o Robert Sapp, Le Center	507-357-4659	C
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	R
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Swift	Nelson Seed Company, Benson	320-843-3610	C
Wabasha	Dill Company, John M. Evers, Wabasha	651-565-2611	C
Wright	Terning Seeds, Inc., Cokato	320-286-2168	C

Milton

Lincoln	Deutz, Daniel, Lake Benton	507-368-9234	R
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Smith, Steven, Darwin	320-693-6769	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Pine	Cabak, Daniel C., Hinckley	320-384-7377	C
Renville	Hanson Seeds, Fairfax	507-426-7320	C
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Stearns	Krippner, Joe, Richmond	320-597-4442	C
Swift	Nelson Seed Company, Benson	320-843-3610	C
Todd	Faust, Kevin, Long Prairie	320-732-3361	C
Todd	Schwanke, Lloyd, Grey Eagle	320-285-5417	C
Wabasha	Dill Company, John M. Evers, Wabasha	651-565-2611	C
Washington	Wagner, W.V., Hastings	651-437-5718	C
Wright	Terning Seeds, Inc., Cokato	320-286-2168	C

Ogle

Faribault	Watonwan Farm Service, Kiester	507-294-3697	C

Paul

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Yellow Medicine	Weber Farms, Hollis & Sandra, Hazel Run	320-564-2435	C

Riser

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Goodhue	Stenlund, Arne H. & Son, Goodhue	651-923-4107	C
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
Lincoln	Lincoln County Feed & Seed, Ivanhoe	507-694-1243	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C
Mower	Zimmerman Seeds, Racine	507-378-2077	R
Norman	Chisholm, Mark M., Gary	218-356-8507	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	R
Stearns	Kane, Tom, Sauk Centre	320-352-5373	C
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Stearns	Nietfeld Farm, Inc., Melrose	320-987-3442	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C R
Wabasha	Dill Company, John M. Evers, Wabasha	651-565-2611	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	C

Troy

Carlton	Korhonen, Art, Kettle River	218-273-4931	C
Lyon	Blomme, Bill, Marshall	507-532-6092	C
Marshall	Newfolden Co-op Elevator Assn., Newfolden	218-874-7465	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Otter Tail	Crop Production Services, Perham	218-346-2355	C
Otter Tail	Miller, Donald, Henning	218-583-2451	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Todd	Schwanke, Lloyd, Grey Eagle	320-285-5417	C

Vista

Olmsted	Meyer's Seeds, Inc., Elgin	507-876-2482	C

RYE

Rymin

Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C R

SOYBEANS

Agassiz

Clay	Johnson, Brian M., Hawley	218-962-3316	C
Clay	Oberg Farms, Moorhead	218-236-9856	C
Clay	Petermann Seeds, Inc., Hawley	218-483-3302	C R
Norman	Hanson, Corey M., Gary	218-356-8678	C
Polk	Bauer Farms, Erskine	218-687-5356	C
Polk	Clementson, Jon, Erskine	218-687-2345	C R
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Polk	Johnstad, David, Beltrami	218-926-5663	C
Polk	Larson Farms, Inc., Owen, Grand Forks	701-775-3546	C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	C
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Polk	Vig Farms Inc., Fosston	218-435-1316	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C

Archer

Nobles	Ocheda Seed Farm, Worthington	507-376-9033	C R

BSR 101

Faribault	Watonwan Farm Service, Kiester	507-294-3697	C

Bert

Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	C
Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C R

Corsoy 79

Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C
Watonwan	Nelson Seed Farm, Gregg, St. James	507-375-5317	C

Council

Clay	Johnson, Brian M., Hawley	218-962-3316	C
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	C R
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Grant	Adams Seed, Wendell	218-458-2151	C R
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Norman	Chisholm, Keith P., Gary	218-356-8674	C R
Norman	Ellingson Farms, Borup	218-861-6605	C
Otter Tail	Brenden, Selvin C., Rothsay	218-867-2134	C

ing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

in	Haugrud Seed Plant, Rothsay	218-493-4275	C R
in	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C
ksoy			
glas	Sward Seed Farm, Nelson	320-762-0143	R
shall	Efta, Joe, Argyle	218-437-6457	C
shall	Kowalski, James, Stephen	218-478-3899	R
shall	Riopelle, Jack L., Argyle	218-437-8147	R
shall	Robertson Brothers, Argyle	218-437-6411	C
man	Chisholm, Keith P., Gary	218-356-8674	R
man	Chisholm, Mark M., Gary	218-356-8507	C
man	Krogstad, Jimmie, Fertile	218-945-6242	C
man	Krogstad, Steve, Fertile	218-945-6336	C
man	Sirjord, Avery, Gary	218-356-8631	R
r Tail	Helmrichs, Larry, Deer Creek	218-462-2634	C
Lake	Swenson Seed Farm, Brooks	218-796-5285	R
natto			
	Heartland Seeds, Moorhead	218-585-4621	C
ans			
cer	Hein Farms, Inc., Audubon	218-439-6621	C
vn	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
	Johnson, Brian M., Hawley	218-962-3316	C
glas	Sward Seed Farm, Nelson	320-762-0143	C
ker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
sey	Northland Seed Corporation, St. Paul	651-221-0855	C
ght	Dahlco Seeds, Inc., Cokato	320-286-5982	C
eborn			
ault	Ehrich Seed Farm, Elmore	507-943-3762	C
ault	Willette Seed Farm, Inc., Delavan	507-854-3595	C R
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
acier			
shall	Sczepanski, Thomas, Stephen	218-478-2462	R
anite			
oln	Deutz, Daniel, Lake Benton	507-368-9234	C R
oln	Popowski, John, Ivanhoe	507-694-1593	C
t	Hauer Farms, Inc., Shakopee	612-445-7554	C
204			
ge	Frontier Commodities, Byron	507-634-6060	R
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
eod	Michaletz, Larry, Lester Prairie	320-395-2629	C
eca	Galler Seeds, Elysian	507-267-4328	C
ght	Dahlco Seeds, Inc., Cokato	320-286-5982	C
rdin 91			
ota	May, Jr., William, Farmington	612-463-8541	C
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
ueur	Goettl Farms c/o R & J Goettl, Le Center	507-357-6509	C
ueur	Haas Seed Farm, Le Sueur	507-665-3683	C
ker	Anderson Seeds, Dassel	320-286-2700	C
ker	Miller Seed Farm, Dassel	320-275-2463	C R
ker	Smith, Steven, Darwin	320-693-6769	C
ker	Wigen Seed Farm, Litchfield	320-693-8182	C
les	Ocheda Seed Farm, Worthington	507-376-9033	C R
ville	Kiecker Seed Company, Hector	507-426-8167	R
t	Hauer Farms, Inc., Shakopee	612-445-7554	C
ght	Dahlco Seeds, Inc., Cokato	320-286-5982	C
1006			
ota	Hoffman, Paul D., Hampton	612-463-4394	C
ota	May, Jr., William, Farmington	612-463-8541	C
ge	Koss, William, Dodge Center	507-374-6786	R
ge	Wright Seed Service, West Concord	507-527-2737	C
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
born	Kuiters, Keith S., Clarks Grove	507-256-4300	C
son	Brunk Bros., Gene or William, Brewster	507-842-5471	C
son	Pietz Farms, Inc., Lakefield	507-662-6309	R
diyohi	Loge, Alan, Willmar	320-235-4178	C
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	C R
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
Lincoln	Jerzak, John, Ivanhoe	507-694-1834	C
Lincoln	Oerter, Donald, Tyler	507-247-3839	C
Meeker	Anderson Seeds, Dassel	320-286-2700	C
Meeker	Miller Seed Farm, Dassel	320-275-2463	C R
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C R
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	C R
Redwood	Lange, Robert A., Windom	507-831-4065	R
Redwood	Sawvell, Ronald, Clements	507-692-2240	R
Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C R
Rice	Salaba, Larry, Faribault	507-334-2603	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C R
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Waseca	Byron Farm Store, Inc., Waseca	507-835-1120	C
Watonwan	Nelson Seed Farm, Gregg, St. James	507-375-5317	C
IA1007			
Dodge	Frontier Commodities, Byron	507-634-6060	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R
IA1008			
Waseca	Galler Seeds, Elysian	507-267-4328	R
IA1009			
Waseca	Galler Seeds, Elysian	507-267-4328	R
IA2008			
Brown	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Le Sueur	Birr Brothers, Mark & Gene, Kasota	507-931-2218	C
Mower	Zimmerman Seeds, Racine	507-378-2077	C
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
IA2008R			
Faribault	Watonwan Farm Service, Kiester	507-294-3697	C
Lincoln	Deutz, Daniel, Lake Benton	507-368-9234	C
Renville	Enestvedt Bros., Sacred Heart	320-765-2728	R
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
IA2012			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
IA2016			
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
IA2020			
Dodge	Frontier Commodities, Byron	507-634-6060	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R
IA2021			
Brown	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Dakota	May, Jr., William, Farmington	612-463-8541	C
Dodge	Koss, William, Dodge Center	507-374-6786	R
Dodge	Wright Seed Service, West Concord	507-527-2737	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Freeborn	Kuiters, Keith S., Clarks Grove	507-256-4300	C
Jackson	Pietz Farms, Inc., Lakefield	507-662-6309	C R
Le Sueur	Goettl Farms c/o R & J Goettl, Le Center	507-357-6509	C
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	C R
Le Sueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	R
Lyon	Olson, Jonathan, Cottonwood	507-423-6340	C R
Nicollet	Anderson & Sons, St. Peter	507-246-5032	C
Nobles	Ocheda Seed Farm, Worthington	507-376-9033	C R
Redwood	Sawvell, Ronald, Clements	507-692-2240	R
Renville	Kiecker Seed, Lanny, Fairfax	507-426-7534	C
Rice	Werner Farm Seeds, Dundas	507-645-7995	C R
Wabasha	Zabel Seeds, Plainview	507-534-2487	C
Waseca	Byron Farm Store, Inc., Waseca	507-835-1120	C
IA2034			
Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R

IA2035

Waseca	Galler Seeds, Elysian	507-267-4328	C R

IA2036

Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C
Jackson	Brunk Bros., Gene or William, Brewster	507-842-5471	C
Jackson	Pietz Farms, Inc., Lakefield	507-662-6309	C R

Jim

Becker	Jirava, James, Ogema	218-983-3448	C
Carlton	Korhonen, Art, Kettle River	218-273-4931	R
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206	C
Clay	Ness, James, Moorhead	218-585-4306	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C R
Marshall	Anderson, Brian C., Stephen	218-455-3495	C
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Marshall	Robertson Brothers, Argyle	218-437-6411	R
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C R
Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Norman	Chisholm, Mark M., Gary	218-356-8507	C
Norman	Ellingson Farms, Borup	218-861-6605	R
Norman	Sirjord, Avery, Gary	218-356-8631	R
Out of state	Anderson, Gerald D, Grand Forks, N.D.	701-775-8766	R
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R
Polk	Balstad, Scott, Fosston	218-435-6311	R
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C R
Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	R
Polk	Mat - Co., Inc., Fosston	218-435-6667	C R
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	R
Polk	Peterson, D.W., Inc., Warren	218-745-4507	R
Polk	Vig Farms Inc., Fosston	218-435-1316	C R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Todd	Faust, Kevin, Long Prairie	320-732-3361	C

Kato

Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Lyon	Olson, Jonathan, Cottonwood	507-423-6340	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C R
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C

Lambert

Clay	Arneson Farms, Hawley	218-483-4165	C
Clay	Fischer, Wilbert & Dale, Glyndon	218-498-2741	C
Clay	Oberg Farms, Moorhead	218-236-9856	C
Dakota	May, Jr., William, Farmington	612-463-8541	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Douglas	Thompson Farms, Kensington	320-965-2486	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Grant	Adams Seed, Wendell	218-458-2151	C R
Grant	Backman Seeds, Herman	320-677-2231	C
Hennepin	Coleman, Craig, Edina	612-924-9161	C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C R
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	C
Meeker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Renville	Kiecker Seed Company, Hector	507-426-8167	C R
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Swift	Falk Seed Farm, Murdock	320-875-4341	C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C

MN0301

Clay	Fuglie, Duane, Ulen	218-596-8528	
Clay	Hastings Farms LLP, Felton	218-494-3935	
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206	
Clay	Tande, Harmen, Moorhead	218-233-0250	
Clay	Thunder Seed, Inc., Hawley	218-483-4637	
Clay	Tobolt Seed, Moorhead	218-287-2904	
Clay	Tri-County Co-op Assn., Ulen	218-596-8821	
Clay	Zimmerman, Wayne, Ulen	218-596-8628	
Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	
Norman	Chisholm, Keith P., Gary	218-356-8674	
Norman	Ellingson Farms, Borup	218-861-6605	
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	
Out of state	Anderson, Gerald D, Grand Forks, N.D.	701-775-8766	
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	
Todd	Faust, Kevin, Long Prairie	320-732-3361	
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	

MN0901

Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	
Clay	Anderson, Lynn, Moorhead	218-287-1765	
Clay	Tobolt Seed, Moorhead	218-287-2904	
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C
Kandiyohi	Bredeson Seed Farm, Willmar	320-235-7315	
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	
Otter Tail	Brenden, Selvin C., Rothsay	218-867-2134	
Renville	JSF, Inc., Sacred Heart	320-765-2225	
Renville	Kiecker Seed Company, Hector	507-426-8167	C
Stearns	Schulzetenberg, John, Melrose	320-987-3638	
Swift	Lee's Seed Farm, Benson	320-843-2857	
Traverse	Rinke, David, Wheaton	320-563-4864	C
Wabasha	Zabel Seeds, Plainview	507-534-2487	
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	

MN1301

Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	
Kandiyohi	Bredeson Seed Farm, Willmar	320-235-7315	
Lyon	Olson, Jonathan, Cottonwood	507-423-6340	
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	
Renville	Kiecker Seed Company, Hector	507-426-8167	
Swift	Falk Seed Farm, Murdock	320-875-4341	

MN1401

Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	
Dakota	Hoffman, Paul D., Hampton	612-463-4394	
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	
Lac qui Parle	Hermanson Seed Plant, Boyd	320-855-2527	
Lac qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	
Le Sueur	Haas Seed Farm, Le Sueur	507-665-3683	
Lincoln	Anderson, Merv, Porter	507-223-7981	
Meeker	Anderson Seeds, Dassel	320-286-2700	
Meeker	Miller Seed Farm, Dassel	320-275-2463	
Meeker	Smith, Steven, Darwin	320-693-6769	
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	
Nicollet	Anderson & Sons, St. Peter	507-246-5032	
Pipestone	Spronk, Art & Sons Seed Farm, Edgerton	507-442-5334	
Renville	Enestvedt Bros., Sacred Heart	320-765-2728	C
Renville	Kiecker Seed Company, Hector	507-426-8167	C
Swift	Nelson Seed Company, Benson	320-843-3610	
Wright	Borg, Loren Seed Farms, Cokato	320-286-2222	

MN1801

Dodge	Wright Seed Service, West Concord	507-527-2737	
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
Jackson	Brunk Bros., Gene or William, Brewster	507-842-5471	
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C

:ing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

diyohi	Bredeson Seed Farm, Willmar	320-235-7315	R
diyohi	Loge, Alan, Willmar	320-235-4178	R
qui Parle	Buer, Reid, Canby	507-223-7946	R
qui Parle	Hermanson Seed Plant, Boyd	320-855-2527	R
qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	R
ueur	Haas Seed Farm, Le Sueur	507-665-3683	R
ueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	R
oln	Oerter, Donald, Tyler	507-247-3839	C
oln	Syltie, Harvey A., Porter	507-296-4649	R
ker	Smith, Steven, Darwin	320-693-6769	R
ker	Wigen Seed Farm, Litchfield	320-693-8182	C R
ver	Zimmerman Seeds, Racine	507-378-2077	R
llet	Anderson & Sons, St.Peter	507-246-5032	R
wood	Lange, Robert A., Windom	507-831-4065	R
wood	Sawvell, Ronald, Clements	507-692-2240	R
ville	Kiecker Seed Company, Hector	507-426-8167	R
	Werner Farm Seeds, Dundas	507-645-7995	C R
asha	Zabel Seeds, Plainview	507-534-2487	C

Call

	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
in	Nordick, J & R, Rothsay	218-867-2605	C

nnatto

in	Friederichs Farm, Foxhome	218-643-2363	C

C Millennium

shall	Stinar, Merle, Warren	218-745-5279	C
	Ritoch, Thomas, Alvarado	218-965-4666	C

rker

born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
oln	Jerzak, John, Ivanhoe	507-694-1834	C
oln	Popowski, John, Ivanhoe	507-694-1593	C
wood	Tauer, Dennis, Springfield	507-723-5866	R

ntry

t	Westrom, Chad B., Elbow Lake	218-685-4232	C

rdy

vn	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
onwood	Imker, Brent, Lamberton	507-752-7697	C
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
qui Parle	Buer, Reid, Canby	507-223-7946	C
qui Parle	Hermanson Seed Plant, Boyd	320-855-2527	C
qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	C R
ueur	Birr Brothers, Mark & Gene, Kasota	507-931-2218	C
ueur	Haas Seed Farm, Le Sueur	507-665-3683	C
wood	Tauer, Dennis, Springfield	507-723-5866	R
ville	Kiecker Seed Company, Hector	507-426-8167	C R
nwan	Nelson Seed Farm, Gregg, St. James	507-375-5317	C
w Medicine	Rosetter, Richard D., Granite Falls	320-564-3620	C

rge

pewa	Caspers, Bryan, Raymond	320-847-3539	C
ta	Hoffman, Paul D., Hampton	612-463-4394	C
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C
t	Adams Seed, Wendell	218-458-2151	C R
t	Dvorak, Adolph, Herman	320-677-2395	C
diyohi	Loge, Alan, Willmar	320-235-4178	C
qui Parle	Buer, Reid, Canby	507-223-7946	R
qui Parle	Hermanson Seed Plant, Boyd	320-855-2527	C
qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	C R
oln	Deutz, Daniel, Lake Benton	507-368-9234	C R
oln	Popowski, John, Ivanhoe	507-694-1593	C
	Huso, Elroy & Howard, Minneota	507-872-6821	R
	Olson, Jonathan, Cottonwood	507-423-6340	C
ker	Wigen Seed Farm, Litchfield	320-693-8182	C
ville	Enestvedt Bros., Sacred Heart	320-765-2728	C R
	Werner Farm Seeds, Dundas	507-645-7995	C
t	Busse Seeds, Appleton	320-394-2315	C R
t	Nelson Seed Company, Benson	320-843-3610	C
Yellow Medicine	Kuehn, Daryl, Echo	507-925-4236	C

Traill

Clay	Olsgaard, Inc., Harold, Moorhead	218-585-4535	C
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	C R
Clay	Thunder Seed, Inc., Hawley	218-483-4637	C
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C R
Mahnomen	Haugo, David, Waubun	218-473-2254	C
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C
Norman	Krogstad, Steve, Fertile	218-945-6336	C
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	C
Out of state	Anderson, Gerald D, Grand Forks, N.D.	701-775-8766	C R
Pennington	Swanson, Curtis W., Thief RiverFalls	218-964-5619	C
Polk	Bauer Farms, Erskine	218-687-5356	C
Polk	Kovar, Frank & Duane, East Grand Forks	218-773-9238	C
Polk	Mid-Valley Grain Cooperative, Crookston	218-281-2881	C
Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C

Turner

Brown	Cunningham Seed Farms, Sleepy Eye	507-794-7323	R
Brown	Gluth, William, Morgan	507-249-3970	R
Brown	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	R
Jackson	Brunk Bros., Gene or William, Brewster	507-842-5471	R
Jackson	Farmers Co-operative Assn., Jackson	507-847-4160	R
Jackson	Rubis, Craig, Lakefield	507-662-6494	R
Redwood	Lange, Robert A., Windom	507-831-4065	R

Vinton 81

Blue Earth	Ramy Seed Co., Michael Ramy, Mankato	507-387-4091	R
Dodge	Frontier Commodities, Byron	507-634-6060	R
Faribault	Willette Seed Farm, Inc., Delavan	507-854-3595	C
Fillmore	Moeller, Virgil, Spring Valley	507-346-2057	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Lyon	Olson, Jonathan, Cottonwood	507-423-6340	C
Mower	Grass & Sons Seed Service, Le Roy	507-324-5820	C

TIMOTHY

Clair

Marshall	Klamar Farms, Gatzke	218-459-3338	C
Roseau	Grahn Farms, c/o Mike Grahn, Roseau	218-463-1765	C
Roseau	Marvin's, Warroad	218-386-1333	C
Roseau	McFarlane Seeds, Inc., Greenbush	218-782-2700	C

Climax

Roseau	McFarlane Seeds, Inc., Greenbush	218-782-2700	C
Roseau	Vatnsdal, David, Roseau	218-463-3239	C

WHEAT

2375

Clay	Lee Seed Farm, Borup	218-494-3330	C
Clay	Thompson, Richard, Barnesville	218-789-7208	C
Clay	Valan, Orlen Jr., Moorhead	218-236-9479	C
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	C
Grant	Adams Seed, Wendell	218-458-2151	C
Grant	Backman Seeds, Herman	320-677-2231	C
Grant	Backman, Tim, Herman	320-677-2785	C
Grant	Red River Marketing Co., Elbow Lake	218-685-6100	C
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C
Lac qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	C
Lincoln	Jerzak, John, Ivanhoe	507-694-1834	C
Lincoln	Popowski, John, Ivanhoe	507-694-1593	C
Marshall	Green, Carl M., Strandquist	218-597-2861	C
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C
Norman	Hanson, Corey M., Gary	218-356-8678	C

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Polk	Balstad, Scott, Fosston	218-435-6311	C
Polk	Barrett, John M., East Grand Forks	218-773-0338	C
Polk	Brule, David A., Crookston	218-281-2944	C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C
Redwood	Hagen, Don, Belview	507-641-5327	C
Renville	Hanson Seeds, Fairfax	507-426-7320	C
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Stearns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C
Wright	Dahlco Seeds, Inc., Cokato	320-286-5982	C
Wright	Hopkins, Joseph, Buffalo	612-682-1868	C
Wright	Terning Seeds, Inc., Cokato	320-286-2168	C

A99ar

Wright	Terning Seeds, Inc., Cokato	320-286-2168	C

AC Barrie

Kittson	Bloomquist Farms, Inc., Drayton	218-455-3863	C R
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R
Polk	Barrett, Glenn R., Angus	218-745-4782	R
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R

Argent

Clay	Zimmerman, Wayne, Ulen	218-596-8628	R
Marshall	Kowalski, James, Stephen	218-478-3899	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Wright	Klein, Christopher, Monticello	612-295-2270	R

BacUp

Polk	Pulkrabek, Anthony H., Angus	218-745-5053	R

Ember

Grant	Adams Seed, Wendell	218-458-2151	R
Grant	Biss, Larry, Wendell	218-458-2205	R
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Otter Tail	Keller, Clifford L., Fergus Falls	218-736-4664	R
Traverse	Johnson, Robert, Wheaton	320-563-4490	R
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R

Forge

Becker	Hein Farms, Inc., Audubon	218-439-6621	C
Clay	Fuglie, Duane, Ulen	218-596-8528	C
Clay	Hastings Farms LLP, Joseph & John, Felton	218-494-3935	C
Clay	Johnson, Brian M., Hawley	218-962-3316	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206	C
Clay	Lee Seed Farm, Borup	218-494-3330	C
Clay	Olek, Bradley, Felton	218-494-3440	C
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	C R
Clay	Sillers Farm, Moorhead	218-233-7841	C
Clay	Thompson, Richard, Barnesville	218-789-7208	C
Clay	Tri-County Co-op Assn., Ulen	218-596-8821	C
Clay	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Grant	Adams Seed, Wendell	218-458-2151	C
Kandiyohi	Loge, Alan, Willmar	320-235-4178	C
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Kittson	Klein, David, Hallock	218-843-2451	C
Kittson	Kotchman, James W., Pembina	701-825-6821	C
Kittson	Osowski, Terry, Hallock	218-843-3371	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Kittson	Stewart, Hilson L., St. Vincent	218-379-3282	C
Lac qui Parle	Harwick, Kenneth, Madison	320-752-4455	R
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	C
Lincoln	Anderson, Merv, Porter	507-223-7981	C
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	C
Marshall	Baird Farms, Inc., Warren	218-745-5330	C R
Marshall	Field, William, Stephen	218-478-3508	C
Marshall	Hammerlund Farms, Oslo	218-695-3481	C
Marshall	Jensen Farms, Stephen	218-478-3398	C R
Marshall	McGlynn, Neil, Stephen	218-478-2777	C
Marshall	Peterson, Maynard, Stephen	218-478-3859	R
Marshall	Pietruszewski, Alan, Stephen	218-478-2431	C
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Marshall	Robertson Brothers, Argyle	218-437-6411	C
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C
Marshall	Stusynski, David, Standquist	218-436-2717	C
McLeod	Thalmann Seeds Inc., Plato	320-238-2185	C
Norman	Brandt, Robert, Ada	218-784-4093	C
Norman	Chisholm, Tim, Gary	218-356-8507	C
Norman	Peppel Bros. Donald & Dennis, Borup	218-582-3242	C
Otter Tail	Brenden, Selvin C., Rothsay	218-867-2134	C
Out of state	Anderson, Gerald D, Grand Forks, N.D.	701-775-8766	C
Pennington	Scholin Farms, Thief River Falls	218-964-5268	C R
Polk	Anderson Farms, Inc., J D, East Grand Forks	218-773-2280	C
Polk	Bauer Farms, Erskine	218-687-5356	C
Polk	Brule, David A., Crookston	218-281-2944	C
Polk	Caillier, Daniel, Crookston	218-281-2840	C
Polk	Capistran Seed Company, Crookston	218-281-7840	C
Polk	Egeland, Inc., John M., Fisher	218-893-2662	C
Polk	H & J Farms, Inc., Warren	218-745-5018	R
Polk	Hanson, Paul M, Crookston	218-281-5898	C
Polk	Kovar, Frank & Duane, East Grand Forks	218-773-9238	C
Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	C
Polk	Larson, Roger O., Euclid	218-281-5697	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	C
Polk	Mid-Valley Grain Cooperative, Crookston	218-281-2881	C
Polk	Novak, James, Angus	218-745-5048	C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C R
Polk	Ross Seed Co., Fisher	218-891-2211	C
Polk	Sonstelie, Gordon & Gary, Winger	218-938-4189	C
Polk	Thompson, Ordean H., East Grand Forks	218-773-2251	C
Red Lake	Myhre Farms, Red Lake Falls	218-698-4485	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C
Red Lake	Vatthauer Farm, Red Lake Falls	218-253-2490	C
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Traverse	Lundquist Seed, Inc., Wheaton	320-563-8622	C
Traverse	Lundquist, Gene, Wheaton	320-563-8644	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C
Wilkin	Friederichs Farm, Foxhome	218-643-2363	R
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C

Gunner

Clay	Lee Seed Farm, Borup	218-494-3330	C
Kittson	Hunter, Daniel, Lancaster	218-762-5331	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Polk	Capistran Seed Company, Crookston	218-281-7840	C R
Polk	Capistran, Kevin, Crookston	218-281-5705	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	C
Polk	Ross Seed Co., Fisher	218-891-2211	C R

HJ98

Clay	Heartland Seeds, Moorhead	218-585-4621	R
Clay	Petermann Seed Farms, Hawley	218-483-3302	C R
Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Grant	Red River Marketing Co., Elbow Lake	218-685-6100	C
Grant	Thiel Seed Service, Wendell	218-458-2415	C
Grant	Westrom, Chad B., Elbow Lake	218-685-4232	R
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Kittson	Gillie Grain, Hallock	218-754-4931	C
Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	R

ting lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

son	Klein, Todd, Scott & Kevin, Hallock	218-843-2764	C
son	Nelson, Merle L., Drayton, N.D.	218-455-3508	C
son	Olsonawski, Jerry, Hallock	218-379-3235	C
son	Petersen, Ronald L., Lake Bronson	218-754-4631	C
son	Schwenzfeier Bros., Hallock	218-754-6891	R
son	Stewart, H. Shane, St. Vincent	218-379-3282	C
son	Stewart, Hilson L., St. Vincent	218-379-3282	C
son	Wiese, Inc., Kenneth A., Humboldt	218-379-3120	R
e Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	R
nomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C R
nomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
shall	Anderson, Harvey & Luther, Stephen	218-455-3305	R
shall	Backstrom Farms, Inc., Warren	218-745-5113	R
shall	Baird Farms, Inc., Warren	218-745-5330	C R
shall	Circle M, Warren	218-745-5610	C
shall	Farmers Elevator Company, Alvarado	218-965-4812	C
shall	Green, Carl M., Strandquist	218-597-2861	C
shall	Hoper, Gary J., Stephen	218-478-2441	C
shall	Jensen Farms, Stephen	218-478-3398	C R
shall	Kowalski, James, Stephen	218-478-3899	C R
shall	Kruger Bros. Farms, Inc., Warren	218-437-8435	C
shall	Kuznia, Kenneth J., Argyle	218-437-8203	R
shall	Omdahl Ridge Farms, Grand Forks	218-745-5595	R
shall	Peterson, Maynard, Stephen	218-478-3859	R
shall	Riopelle, Earl & Brent, Argyle	218-437-8291	C
shall	Riopelle, Jack L., Argyle	218-437-8147	R
shall	Sczepanski, Thomas, Stephen	218-478-2462	C R
shall	Yutrzenka, Don and Mark, Argyle	218-437-8428	C
man	Brandt, Wayne G. & John, Ada	218-784-4774	C
man	Chisholm, Keith P., Gary	218-356-8674	C R
man	Chisholm, Michael, Gary	218-356-8507	C
man	Krogstad, Jimmie, Fertile	218-945-6242	C
man	Krogstad, Steve, Fertile	218-945-6336	C
man	Sirjord Farms, Bejou	218-356-8285	C
man	Sirjord, Avery, Gary	218-356-8631	R
er Tail	Walkup, John, Campbell	218-739-2580	C
nington	Engelstad Farms of Rocksbury, Thf Rvr Falls	218-681-1000	C
nington	Farmers Co-op Grain & Seed, Thf Rvr Falls	218-681-6281	C
nington	Swanson, Curtis W., Thief River Falls	218-964-5619	C
k	Balstad, Scott, Fosston	218-435-6311	R
k	Danielson, Ellsworth, Fosston	218-435-1729	C
k	Fosston Co-op Seed House, Fosston	218-435-6222	R
k	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	R
k	Holy, Donald J., East Grand Forks	218-773-1468	C
k	Larson, Ray H., Inc., Angus	218-745-5923	C
k	Mack Farms, Inc., Ron, East Grand Forks	218-773-2601	C
k	Mat - Co., Inc., Fosston	218-435-6667	C R
k	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	C
k	Peterson, D.W., Inc., Warren	218-745-4507	C R
k	Peterson, Douglas, East Grand Forks	218-773-9120	R
k	Ross Seed Co., Fisher	218-891-2211	C
k	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	C R
k	Vig Farms Inc., Fosston	218-435-1316	C
l Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
eau	Cenex Harvest States Elevator, Badger	218-528-3205	C
vens	Bruer, Michael C., Alberta	320-324-7577	C
kin	Friederichs Farm, Foxhome	218-643-2363	C
kin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C
kin	Steenblock Farms, Dale, Campbell	218-630-5500	C
kin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	R
got			
ker	Flottemesch, Jerome, Callaway	218-375-2141	C
ker	Larson, David G., Lake Park	218-238-5824	C
Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C
Stone	Olson, Wesley E., Clinton	320-325-5565	C
y	Anderson, Lynn, Moorhead	218-287-1765	R
y	Benedict Farms, Inc., Sabin	218-789-7326	C
Clay	Evert Farms Ltd Partnership, Sabin	218-789-7338	C R
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Clay	Ness, Larry, Moorhead	218-585-4179	C
Clay	Nord, Donald & John, Hawley	218-937-5783	C
Clay	Petermann Seed Farms, Hawley	218-483-3302	C R
Clay	Zimmerman, Wayne, Ulen	218-596-8628	C
Douglas	Sward Seed Farm, Nelson	320-762-0143	R
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Grant	Coleman, Gerald, Elbow Lake	218-685-4707	C
Grant	Kapphahn, John M., Elbow Lake	218-685-4604	C R
Grant	Thiel Seed Service, Wendell	218-458-2415	C R
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	C R
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	C R
Kittson	Carlson, James A., Hallock	218-843-3483	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C
Lac qui Parle	Buer, Reid, Canby	507-223-7946	C
Lincoln	Anderson, Merv, Porter	507-223-7981	R
Lincoln	Jerzak, Jerome, Ivanhoe	507-694-1582	R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	C
Marshall	Circle M, Warren	218-745-5610	C
Marshall	Farmers Elevator Company, Alvarado	218-965-4812	C
Marshall	Hammerlund Farms, Oslo	218-695-3481	C
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Marshall	Robertson Brothers, Argyle	218-437-6411	R
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	C R
McLeod	Klapotz, John F., Hutchinson	320-587-8080	R
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Norman	Borge, Brian, Ada	218-784-2168	C
Norman	Brandt, Robert Jr., Ada	218-784-4093	R
Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Otter Tail	Walkup, John, Campbell	218-739-2580	C
Out of state	Anderson, Gerald D, East Grand Forks	701-775-8766	C R
Pennington	Scholin Farms, Thief River Falls	218-964-5268	R
Polk	Amiot, Regis, Crookston	218-281-1255	R
Polk	Brule, David A., Crookston	218-281-2944	C
Polk	Caillier, Daniel, Crookston	218-281-2840	C
Polk	Capistran Seed Company, Crookston	218-281-7840	C
Polk	Hanson, Paul M, Crookston	218-281-5898	C
Polk	Kasprick Farms, Angus	218-745-5016	C
Polk	Kovar, Frank & Duane, East Grand Forks, N.D.	218-773-9238	C
Polk	Larson Farms, Jerry Larson, Climax	218-857-3345	C
Polk	Larson, Arlan Farms, Inc., Climax	218-857-2535	C
Polk	Mack Farms, Inc., Ron, East Grand Forks	218-773-2601	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	C R
Polk	Novak, James, Angus	218-745-5048	C
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	C R
Polk	Ross Seed Co., Fisher	218-891-2211	C
Polk	Thorson Farm, Inc., J. O., East Grand Forks	218-893-2285	R
Polk	Vig Farms Inc., Fosston	218-435-1316	R
Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	C
Red Lake	Nymann Farms, Erik Nymann, Plummer	218-465-4421	C R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	R
Red Lake	Whalen, Greg, Oklee	218-796-5379	C
Stevens	Bruer, Michael C., Alberta	320-324-7577	C
Stevens	Haberer Seed Farm, Morris	320-795-2468	C
Swift	Falk Seed Farm, Murdock	320-875-4341	R
Swift	Klassen, Jim, Benson	320-843-4176	R
Traverse	Johnson, Merton, Wheaton	320-563-8025	R
Traverse	Triple E Farms, Inc., Wheaton	320-563-4239	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C R
Wilkin	Friederichs Farm, Foxhome	218-643-2363	C R
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	C R

Listing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	R

Ivan

Grant	Thiel Seed Service, Wendell	218-458-2415	C
Kittson	Hunter, Daniel, Lancaster	218-762-5331	C
Polk	Capistran Seed Company, Crookston	218-281-7840	C R
Polk	Ross Seed Co., Fisher	218-891-2211	C

Kulm

Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R

Lars

Renville	Ziller Seed Company, Inc., Bird Island	320-365-3674	C

McKenzie

Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Out of State	Terra International, Grand Forks, N.D.	701-775-8183	C R

McVey

Clay	Anderson, Edmund L., Ulen	218-596-8605	R
Clay	Arneson Farms, Hawley	218-483-4165	R
Clay	Lee Seed Farm, Borup	218-494-3330	C R
Clay	Pearson, Karol G., Georgetown	218-861-6668	R
Clay	Petermann Seeds, Inc., Hawley	218-483-3302	R
Clay	Peterson Farm, Sherwood E., Baker	218-789-7378	R
Clay	Sillers Farm, Moorhead	218-233-7841	R
Clay	Tande, Harmen, Moorhead	218-233-0250	R
Clay	Tobolt Seed, Moorhead	218-287-2904	R
Grant	Adams Seed, Wendell	218-458-2151	R
Grant	Jennen, Richard J. & Family, Elbow Lake	218-685-4903	R
Grant	Kapphahn, John M., Elbow Lake	218-685-4604	R
Kandiyohi	Behm Seed Company, Atwater	320-974-3003	R
Kittson	Bloomquist Farms, Inc., Drayton, N.D.	218-455-3863	R
Kittson	Carlson, James A., Hallock	218-843-3483	R
Kittson	Cosley Seed Plant, Humboldt	218-379-3295	C
Kittson	Dowdle Farms, Inc., Kennedy	218-466-2181	C
Kittson	Finney, John N., Humboldt	218-379-3163	C
Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	C
Kittson	Nelson, Merle L., Drayton, N.D.	218-455-3508	R
Kittson	Olsonawski, Jerry, Hallock	218-379-3235	R
Kittson	Osowski, Terry, Hallock	218-843-3371	C
Kittson	Petersen, Ronald L., Lake Bronson	218-754-4631	C R
Kittson	Rynning Farms, Kennedy	218-674-4425	C
Kittson	Schwenzfeier Bros., Hallock	218-754-6891	R
Kittson	Sedenquist Farms, Inc., Kennedy	218-674-4218	C R
Kittson	Sorenson, David, Hallock	218-843-3436	C R
Kittson	Stewart, H. Shane, St. Vincent	218-379-3282	R
Kittson	Stewart, Hilson L., St. Vincent	218-379-3282	R
Kittson	Stromgren Farms, Lake Bronson	218-754-7405	R
Kittson	Sugden, William, Hallock	218-843-2593	R
Kittson	Webster Farms, Inc. J & N, Kennedy	218-674-4497	C
Kittson	Weinlaeder Seed Company, Drayton, N.D.	701-454-6427	R
Kittson	Wiese, Inc., James C., Humboldt	218-379-3257	C
Kittson	Wiese, Inc., Kenneth A., Humboldt	218-379-3120	C
Kittson	Younggren, Dan, Hallock	218-843-3318	C
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	R
Mahnomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C R
Mahnomen	Greenhills, Inc., Mahnomen	218-935-2446	C
Mahnomen	Haugo, David, Waubun	218-473-2254	R
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Marshall	Aakre, Leif, Stephen	218-478-3086	C
Marshall	Anderson, Harvey & Luther, Stephen	18-455-3305	R
Marshall	Anderson, Joel, Alvarado	218-965-4597	C
Marshall	Backstrom Farms, Inc., Warren	218-745-5113	R
Marshall	Baird Farms, Inc., Warren	218-745-5330	C R
Marshall	Circle M, Warren	218-745-5610	C
Marshall	Gostanzik, Stan, Argyle	218-437-8149	R
Marshall	Jensen Farms, Stephen	218-478-3398	R
Marshall	Kowalski, James, Stephen	218-478-3899	R
Marshall	Kruger Bros. Farms, Inc., Warren	218-437-8435	C R
Marshall	Kuznia, Kenneth J., Argyle	218-437-8203	R
Marshall	Omdahl Ridge Farms, Grand Forks	218-745-5595	C R
Marshall	Peterson Farms of Warren, Warren	218-745-4077	C R
Marshall	Riopelle, Earl & Brent, Argyle	218-437-8291	R
Marshall	Riopelle, Jack L., Argyle	218-437-8147	R
Marshall	Riopelle, Larry, Argyle	218-437-8247	R
Marshall	Rivard Farms, Inc., Argyle	218-437-6479	R
Marshall	Rivard's Quality Seeds, Inc., Argyle	218-437-6638	C
Marshall	Sczepanski, Thomas, Stephen	218-478-2462	R
Marshall	Setterholm, Glenn, Argyle	218-437-8294	C
Marshall	Widner, Neil, Stephen	218-478-3616	C
Marshall	Yutrzenka, Don and Mark, Argyle	218-437-8428	R
Norman	Bernhardson, Charles E., Shelly	218-886-7335	R
Norman	Borge, Brian, Ada	218-784-2168	C
Norman	Brandt, Robert, Ada	218-784-4093	R
Norman	Brandt, Wayne G. & John, Ada	218-784-4774	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Norman	Chisholm, Kevin J., Gary	218-945-6116	C
Norman	Chisholm, Mark M., Gary	218-356-8507	C
Norman	Ellingson Farms, Borup	218-861-6605	C R
Norman	Johnson, Donald, Borup	218-784-7569	C
Norman	Kappes, Peter, Ada	218-784-7581	C
Pennington	Dahlen, David E., Goodridge	218-378-4422	C
Pennington	Engelstad Farms of Rocksbury, Thf Rvr Falls	218-681-1000	C R
Pennington	Swanson, Curtis W., Thief River Falls	218-964-5619	R
Polk	Balstad, Scott, Fosston	218-435-6311	R
Polk	Clementson, Jon, Erskine	218-687-2345	C
Polk	Danielson, Ellsworth, Fosston	218-435-1729	R
Polk	Dufault, Tim, Crookston	218-281-1880	C
Polk	Farmers Co-operative Co., Winger	218-938-4126	C
Polk	Fosston Co-op Seed House, Fosston	218-435-6222	C
Polk	Gullekson, Ray, Brent & Brian, Beltrami	218-926-5642	C
Polk	J.E.P. Farm, Euclid	218-745-5915	C
Polk	Larson Farms, Inc., Ralph, East Grand Forks	218-773-1463	R
Polk	Larson, Ray H., Inc., Angus	218-745-5923	R
Polk	LeMar Farms, Inc., Crookston	218-281-5608	C
Polk	Mat - Co., Inc., Fosston	218-435-6667	R
Polk	Ostenaa, Sidney & DeWayne, Mc Intosh	218-563-7395	R
Polk	Peterson, D.W., Inc., Warren	218-745-4507	C R
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R
Polk	Pulkrabek Farms, Inc. Gary, Angus	218-745-5891	R
Polk	Ross Seed Co., Fisher	218-891-2211	C
Polk	Tiedemann, Gene R., Euclid	218-281-6723	R
Polk	Vig Farms Inc., Fosston	218-435-1316	C
Polk	Wentzel, Walton Farms, Inc., Fisher	218-281-2207	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Red Lake	Vatthauer Farm, Red Lake Falls	218-253-2490	R
Roseau	Kukowski, Jim, Strathcona	218-781-2478	R
Roseau	Lund, Ludvig, Roseau	218-463-1029	R
Roseau	Magnusson Farms, Roseau	218-463-2374	R
Roseau	McFarlane Seeds, Inc., Greenbush	218-782-2700	R
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	R
Wilkin	Torkelson, Dennis & Brent, Foxhome	218-736-4607	C

Nora

Polk	Capistran Seed Company, Crookston	218-281-7840	R

Norm

Grant	Westrom, Chad B., Elbow Lake	218-685-4232	R

Oxen

Big Stone	Clinton Ag Service, Inc., Clinton	320-325-5203	C R
Brown	Rossbach Lakeside Seeds, Inc., Hanska	507-794-7698	C
Clay	Brendemuhl, Inc., M-D, Moorhead	218-233-5192	C
Clay	Heartland Seeds, Moorhead	218-585-4621	C
Clay	Johnson, Brian M., Hawley	218-962-3316	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206	C
Clay	Oberg Farms, Moorhead	218-236-9856	C
Clay	Petermann Seed Farms, Hawley	218-483-3302	C R

ing lines show county, grower, town, phone number and class of seed, R for Registered, C for Certified.

	Peterson Farm, Sherwood E., Baker	218-789-7378	C R
	Tri-County Co-op Assn., Ulen	218-596-8821	
	Wetterlin, Jerry & Aaron, Glyndon	218-494-3339	C
	Zimmerman, Wayne, Ulen	218-596-8628	C
ge	Koss, William, Dodge Center	507-374-6786	C
glas	Sward Seed Farm, Nelson	320-762-0143	C
glas	Thompson Farms, Kensington	320-965-2486	C
born	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
it	Adams Seed, Wendell	218-458-2151	C R
it	Backman Seeds, Herman	320-677-2231	C R
it	Biss, Larry, Wendell	218-458-2205	R
it	Kramer, Herman	320-677-2680	C
it	Red River Marketing Co., Elbow Lake	218-685-6100	C R
it	Thiel Seed Service, Wendell	218-458-2415	C
it	Westrom, Chad B., Elbow Lake	218-685-4232	C R
diyohi	Behm Seed Company, Atwater	320-974-3003	C R
ion	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	C
qui Parle	Hermanson Seed Plant, Boyd	320-855-2527	C
qui Parle	Kemen, Robert & Sons, Madison	320-769-4413	C R
ueur	Stangler Farm Seed, Dick, Kilkenny	507-595-2883	C
oln	Jerzak, Jerome, Ivanhoe	507-694-1582	C
oln	Jerzak, John, Ivanhoe	507-694-1834	R
oln	Jerzak, William W., Ivanhoe	507-694-1736	C
n	Olson, Jonathan, Cottonwood	507-423-6340	C
shall	Anderson, Harvey & Luther, Stephen	218-455-3305	R
shall	Jensen Farms, Stephen	218-478-3398	C
eod	Thalmann Seeds Inc., Plato	320-238-2185	C
ker	Anderson Seeds, Dassel	320-286-2700	C
ker	Dahlman Seed Co., Dassel	320-275-2527	C
ker	Johnson Seeds of Dassel, Inc., Dassel	320-275-2430	C
ker	Miller Seed Farm, Dassel	320-275-2463	C R
ker	Smith, Steven, Darwin	320-693-6769	C
ker	Thissen, Ben, Litchfield	320-693-7382	C
ker	Wigen Seed Farm, Litchfield	320-693-8182	C
man	Black, Roger, Bejou	218-945-3550	C
man	Ellingson Farms, Borup	218-861-6605	C
man	Hanson, Corey M., Gary	218-356-8678	C
man	Peppel Bros. Donald & Dennis, Borup	218-582-3242	C
er Tail	Walkup, John, Campbell	218-739-2580	C
c	Brule, David A., Crookston	218-281-2944	C
c	Clementson, Jon, Erskine	218-687-2345	C
c	Mat - Co., Inc., Fosston	218-435-6667	C
c	Vig Farms Inc., Fosston	218-435-1316	C
Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
lwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
ville	Enestvedt Bros., Sacred Heart	320-765-2728	C
ville	Hanson Seeds, Fairfax	507-426-7320	C
ville	JSF, Inc., Sacred Heart	320-765-2225	R
ville	Kiecker Seed Company, Hector	507-426-8167	C
eau	Habstritt Farms, Inc., Roseau	218-463-1193	C
rns	Middendorf Seed Farm, Sauk Centre	320-352-6053	C
vens	Bruer, Michael C., Alberta	320-324-7577	C
vens	Haberer Seed Farm, Morris	320-795-2468	C
vens	Haberer, Ann, Morris	320-795-2468	C
vens	Sperr, Duane & Rollie, Donnelly	320-246-3496	C
ift	Busse Seeds, Appleton	320-394-2315	C R
ift	Falk Seed Farm, Murdock	320-875-4341	C
Swift	Lee's Seed Farm, Benson	320-843-2857	C
Swift	Nelson Seed Company, Benson	320-843-3610	C
Traverse	Lundquist Seed, Inc., Wheaton	320-563-8622	C
Traverse	Lundquist, Steven, Wheaton	320-563-8644	C
Wilkin	Beyer Seed Farm, Kent	218-643-5126	C R
Wilkin	Haugrud Seed Plant, Rothsay	218-493-4275	C R
Wilkin	Knapp Seed Farm, Inc., Foxhome	218-739-3366	C
Wilkin	Nelson, Bradley, Wolverton	218-995-2299	C
Wilkin	Nordick, J & R, Rothsay	218-867-2605	C
Wilkin	Steenblock Farms, Dale, Campbell	218-630-5500	C
Wright	Hopkins, Joseph, Buffalo	612-682-1868	C
Reeder			
Polk	Peterson, Douglas, East Grand Forks	218-773-9120	R
Russ			
Clay	Baker, Jim & Kurt, Sabin	218-789-7360	C
Clay	Krabbenhoft & Sons, Inc., Sabin	218-789-7206	C
Clay	Petermann Seed Farms, Hawley	218-483-3302	C
Grant	Backman Seeds, Herman	320-677-2231	C
Kittson	Johnson Farms, Inc., Lloyd, Karlstad	218-436-2817	C
Mahnomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C
Mahnomen	Pazdernik Farms, Inc., Waubun	218-473-2232	C
Norman	Chisholm, Keith P., Gary	218-356-8674	C
Otter Tail	Brenden, Bruce L., Rothsay	218-867-2410	C
Pennington	Asp, Kenneth, Thief River Falls	218-681-3272	C
Polk	Balstad, Scott, Fosston	218-435-6311	C
Polk	Clementson, Jon, Erskine	218-687-2345	C R
Polk	Johnson, Myron J., East Grand Forks	218-773-1791	C
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Traverse	Lundquist Seed, Inc., Wheaton	320-563-8622	C
Sharp			
Becker	Hein Farms, Inc., Audubon	218-439-6621	C
Freeborn	Albert Lea Seed House, Inc., Albert Lea	507-373-3161	C R
Sharpshooter			
Redwood	Sawvell's Seed, Inc., Clements	507-692-2240	C
Verde			
Kittson	Sorenson, David., Hallock	218-843-3436	C
Lake Of Woods	Helmstetter Farm, Roosevelt	218-442-7285	C R
Mahnomen	Bursch Farms, Inc., Mahnomen	218-935-5353	C R
Mahnomen	Haugo, David, Waubun	218-473-2254	C
Marshall	Jensen Farms, Stephen	218-478-3398	C R
Marshall	Robertson Brothers, Argyl	218-437-6411	R
Norman	Chisholm, Keith P., Gary	218-356-8674	R
Red Lake	Swenson Seed Farm, Brooks	218-796-5285	C R
Roseau	Cenex Harvest States Elevator, Badger	218-528-3205	C
Roseau	Kvien, Kelman M., Roseau	218-463-2116	C

WINTER WHEAT

Arapahoe			
McLeod	Thalmann Seeds Inc., Plato	320-238-2185	C
Seward			
Meeker	Wigen Seed Farm, Litchfield	320-693-8182	C
Norman	Chisholm, Keith P., Gary	218-356-8674	C
Scott	Hauer Farms, Inc., Shakopee	612-445-7554	C

Minnesota Crop Improvement sociation (MCIA), an independent, on-profit association, is Minnesota's ficial seed certification and noxious eed-seed-free forage and mulch rtifying agency. It also provides entity Preserved, Quality Assurance and pre-variety certification of forest reproductive materials and native grasses and forbs services to members. MCIA's Foundation Seed Department distributes Foundation seed of public varieties and provides contract production services for private companies. MCIA also maintains a purity and germination laboratory that provides certification and special-service testing to its members.

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MINNESOTA AGRICULTURAL EXPERIMENT STATION
UNIVERSITY OF MINNESOTA

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